С323.4
R-79

7/X66

ОБЪЕДИНЕННЫЙ
ИНСТИТУТ
ЯДЕРНЫХ
ИССЛЕДОВАНИЙ
Дубна

R - 2944

МАТЕРИАЛЫ XIII МЕЖДУНАРОДНОЙ КОНФЕРЕНЦИИ ПО ФИЗИКЕ ВЫСОКИХ ЭНЕРГИЙ

Беркли 1966 г.

A.H. Rosenfeld

A. H. Rosenfeld, Angela Barbaro-Galtieri, Janos Kirz, W. J. Podolsky, Matts Roos, W. J. Willis, C. G. Wohl.

		$I(J^{PG})C$	Mass (MeV)	Mass difference (MeV)	Mean life (sec)	Mass^2 (BeV)^2	Magnetic moment ($e/2m_p$)	Important decays: Partial mode	Fraction	Q (MeV)	p or p_{max} (MeV/c)
LEPTONS	γ	$J^P=1^-C^-$			stable	0		stable			
	ν_e	J=1/2	0(<0.2 KeV)		stable	0		stable			
	ν_μ		0(<2.1 MeV)			0					
	$e^\mp$	J=1/2	0.511006 ±0.000002		stable	0.000	[b] 1.001159622 ±.000000027	stable			
	$\mu^\mp$	J=1/2	105.659 ±0.002	-33.95 ±0.05	2.2000×10^{-6} ±.0017, S=2.2*	0.011	[c] 1.001162 ±.000005	$e\nu\bar{\nu}$	100%	105.15	52.8
MESONS	$\pi^\pm$	$1(0^{--})C^+_n$	139.577 ±0.014		[a] 2.602×10^{-8} ±.004	0.019		$\mu\nu$	100%	33.92	29.80
								$e\nu$	$(1.24\pm.03)10^{-4}$	139.07	69.80
								$\mu\nu\gamma$	$(1.24\pm.25)10^{-4}$	33.92	29.80
								$\pi^0 e\nu$	$(1.01\pm.09)10^{-8}$	4.09	4.50
	π^0		134.974 ±0.015	4.6056 ±0.0055	[a] 0.89×10^{-16} ±.18 S=1.6*	0.018		$\gamma\gamma$	98.8%	135.00	67.50
								γe^+e^-	(1.19±.05)%	133.95	67.49
								$\gamma\gamma\gamma$	$<5\times10^{-6}$		
								$e^+e^-e^+e^-$	$(3.2\pm.3)10^{-5}$		
	$K^\pm$	$1/2(0^-)$	493.78 ±0.17	-4.04 ± .13	1.235×10^{-8} ±.003 S=1.3*	0.244		$\mu\nu$	(63.4±.5)%	388.1	235.6
								$\pi^0\pi^\pm$	(20.8±.4)%	219.2	205.2
								$\pi^\pm\pi^-\pi^+$	(5.7±.1)% S=1.6*	75.0	125.5
								For other decays see Table S-Decay			
	K^0		497.82 ±0.25		50% K_S 50% K_L						
	K_S			-0.48×$1/\tau_1$ ±0.02 S=1.2*	0.880×10^{-10} ±.017 S=1.6*	0.248		$\pi^+\pi^-$	(69.3±1.1)%	218.5	206.0
								$\pi^0\pi^0$	(30.7±1.1)% S=1.3*	227.8	209.1
	K_L				5.77×10^{-8} ±.59	0.248		$\pi^0\pi^0\pi^0$	(22.7±2.1)%	92.8	139.3
								$\pi^+\pi^-\pi^0$	(11.5± .4)%	83.6	132.8
								$\pi\mu\nu$	(28.8±1.8)%	252.5	216.0
								$\pi e\nu$	(37.0±1.9)%	357.6	229.3
								$\pi^+\pi^-$	(0.162±0.008)%	218.5	206.0
	η	$0(0^{-+})C^+$	548.6 ±0.4		$\Gamma<10$ MeV Theoretically ~100 eV	0.301		all-neutral $\gamma\gamma$	[a] (33.5±2.4)%	548.6	274.3
								all-neutral $\pi^0\gamma\gamma$	(14.9±1.8)%	413.6	257.7
								all-neutral $3\pi^0$	(21.1±1.9)% S=1.2*	143.7	179.4
								charged $\pi^+\pi^-\pi^0$	(25.3±1.4)%	134.5	174.4
								charged $\pi^+\pi^-\gamma$	(5.1± .7)%	269.4	236.1
								charged $\pi^0 e^+e^-$	<(1.1±1.1)%	412.6	257.7
BARYONS	p	$1/2(1/2^+)$	938.256 ±0.005	-1.2933 ±0.0001	stable	0.880	2.792763 ±.000030				
	n		939.550 ±0.005		1.01×10^{3} ±.03	0.882	-1.913148 ±.000066	$pe^-\nu$	100%	0.78	1.19
	Λ	$0(1/2^+)$	1115.63 ±0.05		[a] 2.53×10^{-10} ±.05 S=1.6*	1.242	-0.79 ±0.20	$p\pi^-$	(66.3±1.4)%	37.6	100.2
								$n\pi^0$	(33.6±1.4)% S=1.4*	40.9	103.7
								For other decays see Table S-Decay			
	Σ^+	$1(1/2^+)$	1189.53 ±0.08	7.81 ±0.09	0.810×10^{-10} ±0.13	1.415	2.1±0.8	$p\pi^0$	52.8±1.5 %	116.2	189.0
								$n\pi^+$	47.2±1.5 %	110.3	185.0
								For other decays see Table S-Decay			
	Σ^0		1192.2 ±0.2		$<1.0\times10^{-14}$	1.422		$\Lambda\gamma$	100%	77.0	74.5
								See Table S-Decay			
	Σ^-		1197.33 ±0.13	4.85 ±0.07	1.65×10^{-10} ±.03, S=1.3*	1.433		$n\pi^-$	100%	118.1	192.8
								For other decays see Table S-Decay			
	Ξ^0	$1/2(1/2^+)$?	1314.7 ±1.0	6.5 ±1.0	3.0×10^{-10} ±.5 S=1.3*	1.727		$\Lambda\pi^0$	100%	63.9	134.8
								For other decays see Table S-Decay			
	Ξ^-		1321.2 ±0.2		1.75×10^{-10} ±.05	1.145		$\Lambda\pi^-$	100%	65.8	138.7
								$\Lambda e^-\nu$	$(2\pm1)\times10^{-3}$	204.9	189.4
								$n\pi^-$	$<5\times10^{-3}$	241.7	303.0
	Ω^-	$0(3/2^+)$? ?	1674 ±3		1.5×10^{-10} ±.5	2.806		$\Xi\pi$	~50%	221	296
								$\Lambda\bar{K}$	~50%	66	216

* S = Scale factor = $\sqrt{\chi^2/(N-1)}$ where N = number of experiments. S should be ≈ 1. If S > 1, we have enlarged the error of the mean, dx, i.e., dx → S dx. This is a new convention, but still inadequate, since if S > 1, the real uncertainty is probably even greater than S dx. See text.

a. See notes on Stable Particles following listings of data cards. b. In units of $e/2m_e$. c. In units of $e/2m_\mu$.

MUB-3406

Y503/2 4p.

БИБЛИОТЕКА

Table S—Decay, August 31, 1966

An Appendix to Table S for decay parameters and branching fractions

	Partial mode	Fraction	Q (MeV)	p or p_{max} (MeV/c)	$\alpha^\dagger$	$\beta^\dagger$	$\gamma^\dagger$	$\Delta^\dagger$
$K^\pm$	$\mu^\pm\nu$	(63.4 ±.5)%	388.1	235.6				
	$\pi^\pm\pi^0$	(20.8 ±.4)%	219.2	205.2				
	$\pi^\pm\pi^+\pi^-$	(5.73±.11)%	75.0	125.5				
	$\pi^\pm\pi^0\pi^0$	(1.75±.08)%	84.3	133.0				
	$\pi^0\mu^\pm\nu$	(3.44±.19)%	253.1	215.2				
	$\pi^0e^\pm\nu$	(4.83±.14)%	358.3	228.4				
	$\pi^\pm\pi^\mp e^\pm\nu$	(3.8 ±.8)10^{-5}	214.1	203.5				
	$\pi^\pm\pi^\pm e^\mp\nu$	<0.2 $\times10^{-5}$	214.1	203.5				
	$\pi^\pm\pi^0\gamma$	(2.2 ±.7)10^{-4}	219.2	205.2				
	$\pi^\pm\pi^\mp\mu^\pm\nu$	≤1.4 $\times10^{-5}$	109.0	151.1				
	$\pi^\pm e^+e^-$	<1.1 $\times10^{-6}$	353.2	227.2				
	$\pi^\pm\mu^+\mu^-$	<3 $\times10^{-6}$	142.9	171.9				
	$e^\pm\nu$	(1.9 ±1.2)10^{-5}	493.3	246.9				
	$\pi^\pm\pi^+\pi^-\gamma$	(10±4)10^{-5}	75.0	125.5				
Λ	$p\pi^-$	(66.3 ±1.4)% S=1.4*	37.6	100.2	+0.690±0.048			(15±20)°
	$n\pi^0$	(33.6 ±1.4)%	40.9	103.7				
	$p\mu\nu$	(1.5 ±1.2)10^{-4}	71.5	130.8				
	$pe\nu$	(0.88±0.12)10^{-3}	176.7	163.1				
Σ^+	$p\pi^0$	(52.8 ±1.5)%	116.2	189.0	-0.960±0.067			
	$n\pi^+$	(47.2 ±1.5)%	110.3	185.1	-0.006±0.043			
	$n\pi^+\gamma$	≈0.2 $\times10^{-4}$	110.3	185.1				
	$\Lambda e^+\nu$	≈0.2 $\times10^{-4}$	73.4	71.6				
	$p\gamma$	(1.85±0.4)$\times10^{-3}$	251.1	224.6				
	$n\mu^+\nu$	<1.1 $\times10^{-4}$	144.2	202.4				
	$ne^+\nu$	<0.5 $\times10^{-4}$	249.3	223.6				
Σ^0	$\Lambda\gamma$	100% $\times10^{-4}$	77.0	74.5				
Σ^-	$n\pi^-$	100%	118.1	192.8	-0.017±0.042			
	$n\pi^-\gamma$	≈0.1 $\times10^{-4}$	118.1	192.8				
	$n\mu^-\nu$	(0.62±.12)10^{-3}	152.0	209.4				
	$ne^-\nu$	(1.25±.17)10^{-3}	257.1	229.9				
	$\Lambda e^-\nu$	(0.75±.28)10^{-4}	81.2	79.0				
Ξ^0	$\Lambda\pi^0$	≈100%	63.9	134.8	-0.33±0.10			
	$p\pi^-$	<.5%	236.5	298.7				
	$pe^-\nu$	<.6%	375.5	322.2				
	$\Sigma^+e^-\nu$	<.7%	124.4	119.0				
	$\Sigma^-e^+\nu$	<.6%	116.6	111.9				
Ξ^-	$\Lambda\pi^-$	100%	65.8	138.7	-0.381±0.037	+0.10	0.92	(166±16)°
	$\Lambda e^-\nu$	(2±1)$\times10^{-3}$	204.9	189.4				
	$n\pi^-$	<.5%	241.7	303.0				
	$\Lambda\mu^-\nu$	<1.2%	99.7	162.3				
	$\Sigma^0e^-\nu$	<.3%	128.0	122.2				
	$\Sigma^0\mu^-\nu$	<.5%	22.8	69.5				

†The definition of these quantities is taken as follows:

$$\alpha = \frac{2\,\mathrm{Re}(S^*P)}{|S|^2+|P|^2}; \qquad \beta = \frac{2\,\mathrm{Im}(S^*P)}{|S|^2+|P|^2}; \qquad \gamma = \frac{|S|^2-|P|^2}{|S|^2+|P|^2}; \qquad \tan\Delta = \frac{\beta}{\alpha}.$$

MUB-3407

*Quoted errors include S (scale) factor; see footnote below Table S.

	Mass (MeV)	$I(J^{PG})CA$ ⊢=estab.	Symbol	Γ (MeV)	$(\text{Mass})^2$ $[\Gamma(M^2)]$ (BeV)^2	Important decays: Partial modes	Fraction (%)	Q(d) (MeV)	p or p_{max}(d) (MeV/c)
η	548.6 ±0.4	$0(0^{-+})C^+A^-$	η_β	<10 Theo. ~100 eV	0.301 [<0.004]	See Table S			
S_0 ω	783.4 ±0.9 S=2.0*	$0(1^{--})C^-A^-$	η'_γ	12.0 ±1.5	0.613 [0.02]	$\pi^+\pi^-\pi^0$	~90	369	327
						$\pi^+\pi^-$	seen†	504	366
						neutral($\pi^0\gamma$)	9±.4	648	380
						η+neutral	<1.7	234	199
						$\pi^+\pi^-\gamma$	<5	504	366
						e^+e^-	≈0.015	782	391
						$\mu^+\mu^-$	<0.10	572	377
η'	958.0 ±0.9	$0(0^{-+})C^+A^-$	η'_β	<4	0.918 [<0.008]	$\eta\partial\pi$	77±4	131	232
						$\rho\gamma$	23±4	203	182
$K\bar{K}_0$	1068 ±10	$0(0^{++})C^+A^+$	η_a	80 ±15	1.14 [0.17]	$\pi\pi$	<70	798	516
	May be large scattering length					$K\bar{K}$	>30	73	194
ϕ	1018.6 ±0.5	$0(1^{--})C^-A^+$	η'_γ	3.6 ±0.8	1.039 [0.007]	K_1K_2	38±4	23	109
						K^+K^-	47±4	32	126
						$\pi\rho+3\pi$	15±5	117	188
						$\pi^0\gamma$	?	885	501
						η+neutral	<12	471	362
						$\mu^+\mu^-$	<0.5	808	499
						e^+e^-	<0.3	1018	510
f	1254 ±12	$0(2^{++})C^+A^+$	η''_a	112 ±8	1.57 [0.28]	$\pi\pi$	large	974	611
						4π	<4	695	547
						$\bar{K}K$	<4	265	386
D	1286 ±6	$0(1^{++})C^+A^-$	η_δ	40 ±10	1.65 [0.10]	$K\bar{K}\pi$		154	303
						K^+K		-100	<0
E (a)	1418 ±8	$0(1^{++})CA^-$	η_δ	63 ±8	2.01 [0.17]	$K^+\bar{K}^-$ / $K\bar{K}\pi$ overlap	large	35 293	151 430
f'	1500	$0(2^{++})C^+A^+$	η''_a	80	2.25 [0.24]	$\pi\pi$ small by SU 3		1221	739
						$\bar{K}K$	~60	505	561
						$K\bar{K}^*(890)$	~40	111	274
$\pi^\pm$ π^0	139.6 135.0	$1(0^{-+})C_n^+A^-$	π_β		0.019 [0.018]	See Table S			
$\rho^\pm$	758.3 ±2.8 S=2.8*	$1(1^{--})C_n^-A^+$	π_γ S=2.1*	128.7 ±7.7	0.58 [0.20]	2π	100	486	357
						4π	<5	207	243
ρ^0	756.4 ±3.2, S=1.6*		S=2.1*	115.5 ±8.2		$\pi\gamma$	<2	626	370
						e^+e^-	≈0.005	764	382
						$\mu^+\mu^-$	≈0.003	558	370
$K\bar{K}_1$ (a)	1003	$1(0^{++})C_n^+A^+$	π_a	57	1.006 [.104]	$K^\pm K^0$	large	11	75
						$\eta\pi$	see note	315	333
A1 (b)	1080 ±9	$1(1^{+-})C_n^+A^-$	π_δ	125	1.17 [0.27]	$\rho\pi$	≈100	167	231
						$\bar{K}K$	<4 C forbidden for odd J		
						$\eta\pi$	<1.5	384	380
B (c)	1220	$1(?^{?+})C_n^-A^+$	π	125 ±37 S=2.2*	1.48 [0.31]	$\omega\pi$	≈100	298	339
						$\pi\pi$	<30 (Permitted only for 1^-		
						$\bar{K}K$	<10 assignment, if J <3		
						4π	<50	662	528
A2	1300±9 S= 2.5*	$1(2^{+-})C_n^+$	π''_a	84 ±7 S=1.1*	1.69 [0.22]	$\rho\pi$	≈90	419	426
						$\bar{K}K$	4.6±1.5	333	439
						$\eta\pi$ S= 1.3,	4±4	636	537
Other I=1 bumps excluded.§									
$K^\pm$ K^0	493.8 497.7	$1/2(0^-)A^+$	K_β		0.244 0.248	See Table S			
κ (a)	725	$1/2(0^+)A^+$	K	<12	0.53 [<0.02]	$K\pi$	≈100	92	154
K^*	891.7 ±0.7	$1/2(1^-)A^+$	K_γ	50 ±1.4	0.80 [0.08]	$K\pi$	≈100	258	288
						$K\pi\pi$	<0.2	118	215
						$\kappa\pi$	<0.2	27	82
K_C (a)	1215 ±15	$<3/2(\ )A^-$ ⊢⊣ ??	K	60 ±10	1.476 [0.145]	$K\rho$	~75	-44	<0
						$K^*\pi$	~25	184	253
$K\pi\pi$	1313 ±8	$1/2(1^+)A^-$	K_δ S=1.6*	54 ±20	1.72 .14	$K^*\pi$ / $K\rho$ overlap	large	290 53	340 182
						$K\pi$	?	687	558
K^*	1415 ±6	$1/2(2^+)A^+$	K_a	96 ±7	1.99 [0.27]	$K\eta$	50±10	767	604
						$K^*\pi$	50±10	369	400
						$K\rho$	<10	137	296
						$K\omega$ S=1.5*	1±1	124	281
						$K\eta$	2±1	358	467
$K\pi\pi$	1827 ±31, S=4.9*	$1/2(\ )A^-$	K	83 ±13	3.34 [0.30]	$K\pi\pi$	large	1032	808
						$K\omega$	seen	520	625
						$K\pi$	<5	1167	825
$K^*_{3/2}$ etc. excluded§									

Nonets

$J^P=0^-$	$CP=+1$ 0^+	$CP=-1$ 1^-	$CP=+1$ 1^+	$CP=+1$ 2^+
η				
η'	$K\bar{K}$	ω		
		ϕ	D	f
π	$K\bar{K}$	ρ	E	f'
			A1	
			?	A2
K	?	K^*	?	
			$K\pi\pi$	K^*

§The following bumps, excluded above, are listed among the data cards: S_0(720), 3π(1630), $\pi\pi$(1670), H(975), S(1930), T(2200), U(2390), $K^*_{3/2}$(1175), $K^*_{3/2}$(1270), K^+K^+(1055 and 1280).

†Reported values range between <0.5% and 11%, and depend on assumptions on ρ-ω interference.

*Quoted error includes S (scale) factor. See footnote to Table S.

(a) It has not been shown that this entry corresponds to a state with well defined quantum numbers. The Kappa may well disappear after the 1966 Berkeley Conference.
(b) Bump is an unresolved mixture of resonance and "Deck Effect."
(c) Maybe entirely "Deck Effect."
(d) Q and p are calculated from nominal values which may differ slightly from the latest averages.

Input Data and References for the Four August 1966 Particle Tables. We have not produced a complete revised UCRL-8030, but for the XIII Intl. Conf. on High Energy Physics we have assembled the input data, references, and notes from which these tables were made. They are available from the Conference HQ, LeConte 375, Berkeley Campus, or from the Alvarez Group secretaries, LRL Bldg. 50, Rm. 228.

After the Conference we shall produce a revised UCRL-8030 and submit it to Rev. Mod. Phys. Accordingly we earnestly solicit your calling to our attention data which we have missed or mishandled. We particularly request warnings of redundant data (e.g., the same data appearing in Conference reports, letters, and full papers). All of the authors can be found at LRL ext. 5001.

		Beam π or K (MeV/c)	I(J^P) ⊢ = estab.	Symbol	Mass (MeV)	Γ (MeV)	Mass^2 and [Γ(M^2)] (BeV)^2	Mode	Fraction (%)	Q (MeV)	p or Pmax (MeV/c)
N	p n	See Table S	$\frac{1}{2}(\frac{1}{2}^+)$	N^I_α	938.2 939.6		0.88 0.88			See Table S	
	$N'_{1/2}(1400)$[a]	T = 426 p = 549	$\frac{1}{2}(\frac{1}{2}^+)P_{11}$	N'_α	~1400	≈200	1.96 [0.56]	πN	≈60	322	367
	$N^*_{1/2}(1570)$[a]	T = 663 p = 790	$\frac{1}{2}(\frac{1}{2}^-)S_{11}$	N^I_β	≈ 1570	≈130	2.40 [0.40]	πN Nη	≈30 seen	472 62	478 210
	$N^*_{1/2}(1518)$[a]	T = 610 p = 737	$\frac{1}{2}(\frac{3}{2}^-)D_{13}$	N_γ	≈1518	≈80	2.30 [0.24]	πN $\Delta_\delta\pi$	≈50 seen	440 142	454 222
	$N^*_{1/2}(1700)$[a]	T = 921 p = 1051	$\frac{1}{2}(\frac{1}{2}^-)S_{11}$	N'_β	≈1700	≈240	2.89 [0.82]	πN Nρ	≈90	622 5	580 64
	$N^*_{1/2}(1688)$[a]	T = 900 p = 1030	$\frac{1}{2}(\frac{5}{2}^-)D_{15}$	N^{II}_β	≈1688	≈100	2.86 [0.34]	πN ΛK	≈35	610 75	572 231
	$N^*_{1/2}(1688)$[a]	T = 900 p = 1030	$\frac{1}{2}(\frac{5}{2}^+)F_{15}$	N^{II}_α	≈1688	≈145	2.87 [0.49]	πN $\Delta_\delta\pi$	≈50 seen	610 312	572 372
	$N^*_{1/2}(2190)$	T = 1937 p = 2072	$\frac{1}{2}(\frac{7}{2}^-)$	N^{II}_γ	≈2190	200	4.80 [0.88]	πN ΛK	30	1112 577	888 711
	$N^*_{1/2}(2650)$	T = 3123 p = 3260	$\frac{1}{2}(\frac{11}{2}^-)$ ⊢ ?	N^{III}_γ	2649 ±10	≈300	7.02 [1.59]	πN ΛK	≈7	1572 1037	1154 1022
Δ	$N^*_{3/2}(1236)$	T = 195 p = 304	$\frac{3}{2}(\frac{3}{2}^+)$	$(\Delta^I_\delta)^{++}$	1236.0 ±0.55 $m_0 - m_{++} = 0.45 \pm 0.85$ $m_- - m_{++} = 7.9 \pm 6.8$	120.0 ±2.0 $\Gamma_- - \Gamma_{++} = 25 \pm 23$	1.53 [0.30]	πN	100	158	231
	$N^*_{3/2}(1670)$[a]	T = 867 p = 997	$\frac{3}{2}(\frac{1}{2}^-)$	Δ_β	≈1670	≈180	2.79 [0.60]	πN	≈44	592	560
	$N^*_{3/2}(1920)$	T = 1346 p = 1479	$\frac{3}{2}(\frac{7}{2}^+)$	Δ^{II}_δ	≈1920	≈200	3.69 [0.77]	πN ΣK	≈50	842 229	722 435
	$N^*_{3/2}(2420)$	T = 2502 p = 2638	$\frac{3}{2}(\frac{11}{2}^+)$ ⊢ ?	Δ^{III}_δ	2423 ±10	≈275	5.86 [1.33]	πN ΣK	≈10	1342 729	1023 828
	$N^*_{3/2}(2850)$	T = 3709 p = 3847	$\frac{3}{2}(\frac{15}{2}^+)$ ⊢ ?	Δ^{IV}_δ	2850 ±12	≈300	8.12 [1.71]	πN	≈3	1772	1266
Z	$Z^*_0(1865)$	T = 761 p = 1153	0(1/2) ⊢ ?	Z_0	1863	150	3.48 [0.56]	KN Δ_δK	≈55	432 135	579 320
Λ	Λ	See Table S	$0(\frac{1}{2}^+)$	Λ^I_α	1115.4		1.24			See Table S	
	$Y^*_0(1405)$	<0 K$^-$p	$0(\frac{1}{2}^-)$	Λ_β	≈1405[b]	≈35[b]	1.97 [0.10]	Σπ	100	68	142
	$Y^*_0(1520)$	T = 138 p = 395	$0(\frac{3}{2}^-)$	Λ^I_γ	1518.8 ±1.5	16 ±2	2.31 [0.05]	$\bar{K}N$ Σπ Λππ	29±4 55±7 16±2	83 183 125	237 260 252
	$Y^*_0(1670)$	T = 393 p = 737	$0(\frac{1}{2}^-)$	Λ'_β	≈1670	≈18	2.79 [0.06]	$\bar{K}N$ Λη	seen seen	233 6	410 66
			May be s-wave scattering length of either sign.								
	$Y^*_0(1815)$	T = 662 p = 1046	$0(\frac{5}{2}^+)$	Λ^{II}_α	1815	≈50	3.29 [0.18]	$\bar{K}N$ Σπ Λη $Y^*_1(1385)\pi$	≈75 ≈9 ≈1 ≈15	378 478 151 290	538 499 344 358
	$Y^*_0(2110)$	T = 1280 p = 1703	$0(\frac{7}{2}^-)$	Λ^{II}_γ	2110	155	4.45 [0.65]	$\bar{K}N$ Σπ	≈32	673 773	755 706
Σ	Σ	See Table S	$1(\frac{1}{2}^+)$	Σ^I_α	+ 1189.5 0 1192.6 - 1197.4		+ 1.41 0 1.42 - 1.43			See Table S	
	$Y^*_1(1385)$	<0 K$^-$p	$1(\frac{3}{2}^+)$	Σ^I_δ	+ 1381.0 s = 1.3[c] ±1.0 - 1384.0 s = 1.6[c] ±1.2	40±4 s = 2.2[c] 46±9 s = 3.4[c]	1.92 [0.12]	Λπ Σπ	91±2 9±2 s = 1.4[c]	130 48	208 117
	$Y^*_1(1660)$	T = 375 p = 716	1(3/2) ⊢ ?	Σ_γ	≈1660	≈50	2.76 [0.17]	$\bar{K}N$ Λπ Σπ Λππ $Y^*_0(1405)\pi \leftarrow \Sigma\pi\pi$	~15 ~5 ~30 ~20 ~30	223 405 323 265 184	400 439 379 389 316
			Large contradictions among measured branching ratios.								
	$Y^*_1(1765)$	T = 558 p = 928	$1(\frac{5}{2}^-)$	Σ_β	1767 ±4 s = 1.1[c]	84 ±12 s = 2.0[c]	3.10 [0.30]	$\bar{K}N$ Λπ Σπ $Y^*_1(1385)\pi$ $Y^*_0(1520)\pi$	≈50 14 <3 ≈10 15	323 510 423 235 100	492 514 458 311 182
	$Y^*_1(1915)$	T = 861 p = 1262	$1(\frac{5}{2}^+)$ ⊢ ?	Σ^{II}_α	≈1915	≈65	3.67 [0.25]	$\bar{K}N$ Λπ	≈10 ≈12	478 660	616 622
	$Y^*_1(2035)$	T = 1114 p = 1530	$1(\frac{7}{2}^+)$	Σ^{II}_δ	2035	160	4.14 [0.65]	$\bar{K}N$ Λπ Σπ	≈20 ≈20	598 785 698	703 703 655
Ξ	Ξ	See Table S	$\frac{1}{2}(\frac{1}{2}^+)$ ⊢ ?	Ξ_α	0 1314 - 1321		0 1.73 - 1.75			See Table S	
	$\Xi^*_{1/2}(1530)$	(p wave)	$\frac{1}{2}(\frac{3}{2}^+)$	$(\Xi_\delta)^0$	1528.7 ±1.1 $m_- - m_0 = 4.2 \pm 1.7$	7.3 ±1.7	2.34 [0.02]	Ξπ	100	70	145
	$\Xi^*_{1/2}(1820)$		$\frac{1}{2}(\frac{3}{2}^-)$ ⊢ ?	Ξ_γ	1815 ±3	16 ±8 s = 2.2[c]	3.31 [0.06]	$\Lambda\bar{K}$ Ξπ $\Xi^*(1530)\pi$	≈65 ~10 ~20	207 360 150	396 413 234
			Branching ratios poorly known.					Ξππ	~5	220	356
	$\Xi^*_{1/2}(1933)$		$\frac{1}{2}(\frac{5}{2}^+)$ ⊢ ?	Ξ^{II}_α	1933 ±16	140 ±35	3.74 [0.54]	Ξπ $\Lambda\bar{K}$		473 320	501 505
Ω	Ω^-	See Table S	$0(\frac{3}{2}^+)$	Ω_δ	1675		2.81			See Table S	

See listings for other states for which there is evidence, but which are omitted from this table: $N^*_{1/2}(3030)$, $N^*_?(3245)$, $N^*_{3/2}(3230)$, $N^*_{5/2}(1570)$, $Z^*_1(1910)$, $Y^*_0(2340)$, $Y^*_1(2260)$, $\Xi^*_{1/2}(1705)$.

a. Resonance parameters are dependent on difficult and uncertain readings of Argand diagrams from phase-shift analyses. See baryon notes following data listings.

b. Effective-range fits give M = 1409.4 ± 1.1 (s = 1.5[c]) and Γ = 36 ± 2. See listings.

c. Quoted error includes s (scale) factor. See footnote to Table S.

INPUT DATA, REFERENCES, AND NOTES
UCRL-8030, August 1966 Revision

Arthur H. Rosenfeld, Angela Barbaro-Galtieri, Janos Kirz,
William J. Podolsky, Matts Ross, William J. Willis,
and Charles Wohl

This document includes:

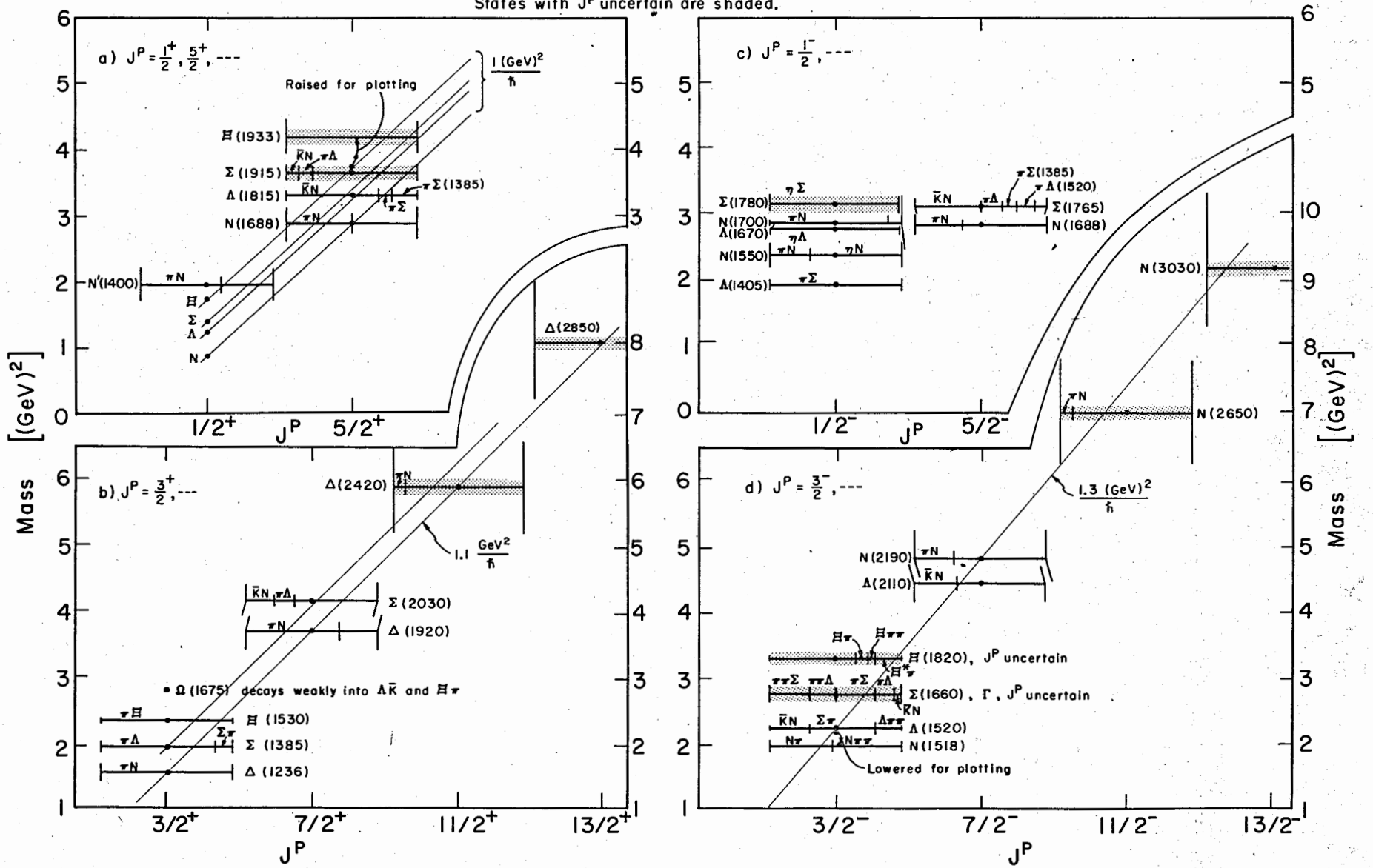
1. Index and Listings of input data and references.
2. Notes on individual stable particles, meson resonances, and baron resonances, in that order.

After the XIII High Energy Conference (in Berkeley) we intend to revise UCRL-8030 and submit it to Review of Modern Physics. Accordingly we earnestly solicit comments. All the authors can be found at LRL extension 5001 (Alvarez Group).

The Input Data and References for Stable Particles and Baryons are reasonably up to date. We got to Mesons last, and apologize that they are not complete.

BARYON STATES, UCRL-8030 Rev.
Aug. 1966

Vertical bars : $\Gamma(m^2) = 2m\Gamma$ = full width.
Horizontal bars subdivided proportional to branching fractions.
States with J^P uncertain are shaded.



HUB-12336

Index to the Particle Listing

In the summary tables, data listings, and references, we have ordered the particles as below. The ordering is fairly natural: for stable particles, merely by mass; for resonances, according to B, $|S|$, I, and M. Our bookkeeping number assigned to each particle (e.g., the ϕ meson is "U 4") is essentially arbitrary.

Stable particles	Meson resonances		Baryon resonances	
γ	†$\sigma(390)$	†$\pi\pi\pi(1630)$	$N^*(1400)$	$Z_0(1865)$
ν_e	†$S^0(720)$ or ϵ^0	†$\pi\pi(1670)$	$N^*(1570)$	†$Z_1(1910)$
ν_μ	$\omega(783)$	$S(1930)$	$N^*(1518)$	
e	$\eta'(958)$ or X^0	$T(2200)$	$N^*(1700)$	$Y_0^*(1405)$
μ	†$H(975)$	$U(2390)$	$N^*(1688)$	$Y_0^*(1520)$
$\pi^\pm$	$\phi(1019)$		$N^*(1688)$	$Y_0^*(1670)$
π^0	$K\bar{K}_0(1068)$	$\kappa(725)$		$Y_0^*(1815)$
$K^\pm$	$f(1254)$	$K^*(892)$	$N^*(2190)$	$Y_0^*(2110)$
K^0	$D(1286)$	$K_c(1215)$	$N^*(2650)$	†$Y_0^*(2340)$
K_1^0	$E(1418)$.	$K\pi\pi(1320)$	†$N^*(3030)$	
K_2^0	$f'(1500)$	$K^*(1400)$	†$N^*(3245)$	$Y_1^*(1385)$
η		$K\pi\pi(1800)$		$Y_1^*(1660)$
p	$\rho(756)$	†$K^*_{3/2}(1175)$	$\Delta(1236)$	$Y_1^*(1760)$
n	$K\bar{K}_1(1003)$	†$K^*_{3/2}(1270)$	$\Delta(1670)$	$Y_1^*(1915)$
Λ	$A_1(1080)$	†$K^+K^+(1055)$	$\Delta(1920)$	$Y_1^*(2035)$
Σ^+	$B(1220)$	$K^+K^+(1280)$	$\Delta(2420)$	†$Y_1^*(2260)$
Σ^-	$A_2(1300)$		$\Delta(2850)$	
Σ^0			†$\Delta(3230)$	$\Xi^*_{1/2}(1530)$
Ξ^-				†$\Xi^*_{1/2}(1705)$
Ξ^0			†$N^*_{5/2}(1570)$	$\Xi^*_{1/2}(1820)$
Ω^-				$\Xi^*_{1/2}(1933)$

†Omitted from summary tables.

DATA FOR TABLES ON STABLE PARTICLES

STABLE MEANING IMMUNE TO STRONG DECAY

CODE — EVENTS ABOVE BACKGROUND — QUANTITY — ERROR+ — ERROR− — REFERENCE — YR — TECN — SIGN — COMMENTS — DATE PUNCHED

N ANY SYMBOL IN COLUMN 8 INDICATES DATA IGNORED BY AVERAGING PROGRAMS

γ

C GAMMA (C,J=1)

ν_e

1 E-NEUTRINO (0,J=1/2)

1 E-NEUTRINO MASS (MEV)

S 1M	*	LESS THAN		0.25	LANGER	52	CNTR			
S 1M	*	LESS THAN		C.15	HAPILTON	53	CNTR			
S 1M	*	LESS THAN	0.55	+OR− 0.28	FRIEDMAN	58	CNTR			

ν_μ

2 MU-NEUTRINO (0,J=1/2)

2 MU-NEUTRINO MASS (MEV)

S 2M	*		3.5	OR LESS	BARKAS	56	EMUL			
S 2M	*		4.0	OR LESS	DUDZIAK	59	CNTR			
S 2M	*		3.6	OR LESS	FEINBERG	63	RVUE			7/66
S 2M	*		3.0	OR LESS	ALLCOCK	65	RVUE			7/66
S 2M	*		2.5	CR LESS	BARCON	65	SPRK			
S 2M	*		2.1	OR LESS	SHAFER	65	CNTR	CONF LEV = 68PCT		7/66

---

e

3 ELECTRON (0.5,J=1/2)

3 ELECTRON MASS (MEV)

S 3M		0.511006	C.CCCCC2		COHEN	65	RVUE			

---

3 ELECTRON LIFETIME (UNITS 10**21 YR)

S 3T	*	OVER		2.C	MOE	65	CNTR			6/66

---

3 ELECTRON MAGNETIC MOMENT(E/2ME)

S 3MM	*	1.CC116CS	.CCCCC24		SCHUPP	61	CNTR	−		
S 3MM		1.001159622	+-(27)*10**-9		WILKINSON	63	CNTR	−		8/66
S 3MM	*	1.001168	0.CCCC11		RICH	66	CNTR	+ POSITRON		8/66

μ

4 MUON (106,J=1/2)

4 MUON MASS (MEV)

S 4M		105.659	C.CC2		FEINBERG	63	RVUE			

---

4 MUON LIFETIME (UNITS 10**-6)

S 4T		2.2CC	C.C15	0.C15	FISHER	59	CNTR			
S 4T		2.225	C.006	0.006	ASTBURY	60	CNTR			
S 4T		2.211	C.003	0.003	REITER	60	CNTR			
S 4T		2.208	C.004	0.004	TELEGDI	60	CNTR			
S 4T		2.203	C.004	0.004	LUNDY	62	CNTR			
S 4T		2.198	C.001	0.001	FARLEY	62	CNTR			
S 4T		2.202	C.003	0.C3	ECKHAUSE	62	CNTR			
S 4T		2.197	C.CC2	0.C02	MEYER	63	CNTR	+		
S 4T		2.198	C.CC2	0.002	MEYER	63	CNTR	−		7/66

---

4 RATIO OF LIFETIME OF MU+ TO MU−

S 4LR		1.CCC	0.CC1		MEYER	63	CNTR	LIFETIME MU+/MU−		7/66

---

4 MUON PARTIAL DECAY MODES

S 4P1	MUON INTO E (E-NEU) (MU-NEU)	S 3S 1S 2	
S 4P2	MUON INTO E 2GAMMA	S 3S 0S 0	
S 4P3	MUON INTO 3ELECTRONS	S 3S 3S 3	
S 4P4	MUON INTO E GAMMA	S 3S 0	

---

4 MUON BRANCHING RATIOS

S 4R1	*	MUON INTO E+2GAMMA (IN UNITS OF 10**-5)						(P2)/(P1)		
S 4R1	*	LESS THAN		1.6	FRANKEL 1	63	SPRK			
S 4R2	*	MUON INTO 3E (IN UNITS OF 10**-7)						(P3)/(P1)		
S 4R2	*	LESS THAN		5.0	PARKER 1	62	CNTR			
S 4R2	*	LESS THAN		1.3	ALIKHANOV	62	SPRK			
S 4R2	*	LESS THAN		1.5	FRANKEL 2	63	CNTR			
S 4R2	*	LESS THAN		1.45	BABAEV	63	SPRK			
S 4R3	*	MUON INTO E+GAMMA (IN UNITS OF 10**-8)						(P4)/(P1)		
S 4R3	*	LESS THAN		1.2	FRANKEL 1	63	SPRK			
S 4R3	*	LESS THAN		0.6	PARKER 2	64	SPRK			

---

4 MUON MAGNETIC MOMENT (IN E/(2*MUON MASS))

S 4MM		1.001162	C.CCCCC5		CHARPAK	62	CNTR			

$\pi^\pm$

8 CHARGED PION (140,JPC=0−+) I=1

8 CHARGED PI MASS (MEV)

S 8M	*		139.37	0.20		CROWE	54	CNTR	−	
S 8M	*		139.68	0.15		BARKAS	56	EMUL	+	
S 8M			139.577	0.014		SHAFER	65	CNTR		6/66

---

8 PI+ MU+ MASS DIFFERENCE (MEV)

S 8D			34.CO	C.C76		BARKAS	56	EMUL		
S 8D			33.89	0.076		BARKAS	56	EMUL		

---

8 CHAR.PI LIFETIME (UNITS 10**-9)

S 8T	N		25.6	0.5	0.5	CROWE	57	RVUE		
S 8T	N		25.6	C.8	0.8	ANDERSON	60	CNTR		
S 8T	N	8000	25.46	0.32	0.32	ASHKIN	60	CNTR	+	
S 8T	N					HERRISON	62	RVUE		
S 8T			26.01	C.02		ECKHAUSE	65	CNTR	+	6/66
S 8T	N		25.6	C.9		BARDON	66	CNTR		6/66
S 8T	N		25.85	C.35		DUNAITSEV	66	CNTR		6/66
S 8T			26.40	C.C8		KINSEY	66	CNTR	+	6/66
S 8T	N	FOR RECOMMENDED LIFETIME SEE NOTES ON TABLE 5 FOLLOWING LISTING								

---

8 RATIO OF LIFETIME OF PI− TO PI+

S 8LR			1.004	0.007		BARDON	66	CNTR	LIFETIME PI-/PI+	7/66

---

8 CHARGED PION PARTIAL DECAY MODES

S 8P1	CHAR.PION INTO MU (MU-NEU)	S 4S 2
S 8P2	CHAR.PION INTO E (E-NEU)	S 3S 1
S 8P3	CHAR.PION INTO MU (MU-NEU) GAMMA	S 4S 2S 0
S 8P4	CHAR.PION INTO PIO E (E-NEU)	S 9S 3S 1
S 8P5	CHAR.PION INTO E NEU GAMMA	S 3S 1S 0

---

8 CHARGED PION BRANCHING RATIOS

S 8R1	*	CHAR.PION INTO MU NEU GAMMA (UNITS 10**-4)						(P3)/(P1)		
S 8R1		26	1.24	0.25		CASTAGNOL	58	EMUL		
S 8R2	*	CHAR.PION INTO E NEU (UNITS 10**-4)						(P2)/(P1)		
S 8R2			1.21	C.07		ANDERSON	60	CNTR		
S 8R2			1.247	C.028		DI CAPUA	64	CNTR		
S 8R3	*	CHAR.PION INTO PIO E NEU (UNITS 10**-8)						(P4)/(P1)		
S 8R3	N	10	2.0	C.6		BACASTOW	62	CNTR		
S 8R3	N	52	1.17	0.12		DEPOMMIER	64	CNTR		
S 8R3	N	36	0.97	C.2C		BARTLETT	64	SPRK		
S 8R3	N	38	1.C7	0.21		BACASTOW	65	SPRK	+	
S 8R3	N		1.10	C.26		BERTRAM	65	SPRK		6/66
S 8R3	N	43	1.1	0.2		DUNAITSEV	65	CNTR		7/66
S 8R3			1.C1	0.08	0.10	DEPOMMIER	66	CNTR		6/66
S 8R3	N	FOR RECOMMENDED BRANCHING RATIO SEE NOTES ON TABLE 5 FOLLOWING LISTING								
S 8R4	*	CHAR.PION INTO E NEU GAMMA (UNITS 10**-8)						(P5)/(P1)		
S 8R4		143	3.0	0.5		DEPOMMIER	63	CNTR		6/66

π^0

9 NEUTRAL PION (135,JPC=0−+) I=1

9 PI MASS DIFFERENCE (PI+-)-(PIO)(MEV)

S 9D			5.27	1.0		PANOFSKY	51	CNTR	−	
S 9D			4.50	0.31		CHIKOWSKY	54	CNTR	−	
S 9D			4.62	C.05		MACDONALD	59	CNTR	−	
S 9D			4.6C	0.04		HILLMAN	59	CNTR		
S 9D			4.55	0.07		CASSELS	59	CNTR		
S 9D			4.6056	C.0C55		CZIRR	63	CNTR		
S 9D			4.59	C.03		PETRUKHIN	63	CNTR	−	

---

9 PIO LIFETIME (UNITS 10**-16)

S 9T	N	T6	1.9	0.5	0.5	GLASSER	61	EMUL		
S 9T	N	45	2.3	1.1	1.0	TIETGE	62	EMUL		
S 9T	N	88	2.8	C.9	0.9	KELLER	63	EMUL		
S 9T			1.C5	C.18	0.18	VON DARDE	63	CNTR		
S 9T	N	75	1.7	0.5		SHAW	64	EMUL		
S 9T		67	0.730	C.1C5		BELLETTIN	65	CNTR		~6/66
S 9T	N	67	1.6	C.6	0.5	EVANS	65	EMUL		6/66
S 9T	N	FOR RECOMMENDED LIFETIME SEE NOTES ON TABLE 5 FOLLOWING LISTING								

---

9 NEUTRAL PION PARTIAL DECAY MODES

S 9P1	PIO INTO 2GAMMA	S 0S 0
S 9P2	PIO INTO E+ E- GAMMA	S 3S 3S 0
S 9P3	PIO INTO 4ELECTRONS	S 3S 3S 3S 3
S 9P4	PIO INTO 3 GAMMA	S 0S 0S 0

---

9 NEUTRAL PION BRANCHING RATIOS

S 9R1	*	PIO INTO (GAMMA E+ E-)/(2GAMMA)						(P2)/(P1)		
S 9R1			0.0118	C.CCC4B		SAMIOS	61	HBC		
S 9R1	*	USING PANOFSKY RATIO = 1.94								
S 9R1		27	0.0117	0.0015		BUDAGOV	60	HBC		
S 9R2	*	PIO INTO (3 GAMMA)/(2 GAMMA) (UNITS 10**-8)						(P4)/(P1)		
S 9R2	*	C	5.0 CR LESS			DUCLOS	65	CNTR	CL=90 PERCENT	6/66
S 9R3	*	PIO INTO (E+E+E-E-)/(2 GAMMA) (UNITS 10**-5)						(P3)/(P1)		
S 9R3		146	3.18	0.30		SAMIOS	62	HBC		6/66

REFERENCES FOR TABLES ON STABLE PARTICLES

AUTHOR	YR	JOURNAL	VOL.	PAGE	AUTHORS // LABORATORIES	CODE

ν_e

1 E-NEUTRINO (0,J=1/2)

LANGER	52	PR	88	689	L M LANGER,R J D MOFFAT //////// INDIANA	S 1
KAPILTON	53	PR	92	1521	D KAPILTON,H F ALFORD,L GROSS // PRINCETON	S 1
FRIEDMAN	58	PR	109	2214	LEWIS FRIEDMAN,LINCOLN G SMITH ///// BNL	S 1

ν_μ

2 MU-NEUTRINO (0,J=1/2)

BARKAS	56	PR	101	778	W H BARKAS,W BIRNBAUM,F M SMITH //// LRL	S 2
CUCCIAK	59	PR	114	336	N F OLOCIAK,R SAGANE,J VECCER ////// LRL	S 2
FEINBERG	62	ARNS	13	431	G FEINBERG, L M LEDERMAN //////// COLUMBIA	S 2
ALLCOCK	62	PPSL	80	675	G R ALLCOCK ////////////////////// LIVERPOOL	S 2
BARDON	65	PRL	14	449	BARDON,BERTON,PEOPLES +//CCLUM+STONY BROOK	S 2
SHAFER	65	PRL	14	923	R E SHAFER,CROWE,JENKINS ////////// LRL	S 2

e

3 ELECTRON (0.5,J=1/2)

SCHUPP	61	PR	121	1	A A SCHUPP,R W PIDD,H R CRANE // MICHIGAN	S 3
WILKINSO	63	PR	130	852	D T WILKINSON,H R CRANE ////////// MICHIGAN	S 3
COHEN	65	RMP	37	537	E R COHEN, J W M DUMOND //// NAASC+CALTECH	S 3
MOE	65	PR	140	B 952	M K MOE,F REINES //// CASE INST TECHNOLOGY	S 3
RICH	66	PRL	17	271	A RICH, H R CRANE // MICHIGAN	S 3

μ

4 MUON (1/2,J=1/2)

FISHER	55	PRL	3	345	FISHER,LEDNICKY,LUNDBY,MEUNIER,STROOT//CERN	S 4
ASTBURY	60	ROCH	CONF	60	542 ASTBURY,WATTERSLEY,HUSSAIN + // LIVERPOOL	S 4
DEVONS	60	PRL	5	330	DEVONS,GIDAL,LEDERMAN,SHAPIRO // COLUMBIA	S 4
LATTHROP	60	NC	17	1169	J LATTHROP,R A LUNDY,S PENMAN + //// EFINS	S 4
REITER	60	PRL	5	22	REITER,ROMANOWSKI,SUTTON + ///// CARNEGIE	S 4
TELEGDI	60	ROCH	CONF	60	713 V L TELEGDI ////////////////////// CERN	S 4
CHARPAK	61	PRL	6	128	CHARPAK,FARLEY,GARWIN,MULLER,SENS + //CERN	S 4
HUTCHINS	61	PRL	7	129	D P HUTCHINSON,J MENES + ////// COLUMBIA	S 4
ALIKHANO	62	CERN	CONF	423	A I ALIKHANOV,A BABAEV + /// ITEP MOSCOW	S 4
CHARPAK	62	PL	1	16	G CHARPAK,F J M FARLEY,R L GARWIN + //CERN	S 4
FARLEY	62	CERN	CONF	415	FARLEY,PASSAP,MULLER,ZICHICHI ///// CERN	S 4
LUNDY	62	PR	125	1686	RICHARD A LUNDY ////////////////////// EFINS	S 4
PARKER	62	NC	23	489	S PARKER,S PENMAN ////////////////// EFINS	S 4
SHAPIRO	62	PR	125	1022	G SHAPIRO,L M LEDERMAN ////////// COLUMBIA	S 4
BABAEV	63	JETP	16	1367	BABAEV,BALATS,KAFTANOV,LANDSBERG + // ITEP	S 4
ECKHAUSE	63	PR	132	422	M ECKHAUSE,T A FILIPPAS + /////// CARNEGIE	S 4
FEINBERG	63	ARNS	13	431	GERALD FEINBERG, L M LEDERMAN /// COLUMBIA	S 4
FRANKEL	63	NC	27	854	S FRANKEL,W FRATI,J WALPERN + ////// PENNA	S 4
FRANKEL	63	PR	130	351	S FRANKEL,W FRATI,J WALPERN + ////// PENNA	S 4
MEYER	63	PR	132	2653	S L MEYER,ANDERSON,BLESER,LEDERMAN+//CCLUM	S 4
PARKER	64	PR	1338	768	S PARKER,N L ANDERSON,C REY /////// EFINS	S 4

$\pi^\pm$

8 CHARGED PION (140,JPG=0--)I=1

CROWE	54	PR	96	470	K M CROWE,R H PHILLIPS ////////////// LRL	S 8
BARKAS	56	PR	101	778	W H BARKAS,W BIRNBAUM,F M SMITH ////// LRL	S 8
CROWE	57	NC	5	541	K M CROWE ////////////////// STANFORD MEPL	S 8
CASTAGNO	58	PR	112	1779	C CASTAGNOLI,M MUCHNIK ////////// ROME I F	S 8
ANDERSON	60	PR	119	2050	H L ANDERSON,T FUJII,R H MILLER + // EFINS	S 8
ASHKIN	60	NC	16	456	ASHKIN,FAZZINI,FIDECARO,LIPMAN + //// CERN	S 8
PERRISON	62	ADVP	11	1	A W PERRISON ////////////////////// LIVERPOOL	S 8
SHAPIRO	62	PR	125	1022	G SHAPIRO,L M LEDERMAN ////////// COLUMBIA	S 8
CZIRR	63	PR	130	341	JOHN B CZIRR ////////////////////////// LRL	S 8
DEPOMMIE	63	PL	7	285	P DEPOMMIER,HEINTZE,RUBBIA,SCERGEL // CERN	S 8
BARTLETT	64	PR	1368	1432	BARTLETT,DEVONS,MEYER,ROSEN ///// COLUMBIA	S 8
DI CAPUA	64	PR	1338	1333	DI CAPUA,GARLAND,PONDROM,STRELZOFF //CCLUM	S 8
BACASTOW	65	PREPRINT(SLAC)				S 8
BERTRAM	65	PR	139	B 617	BERTRAM,MEYER,CARRIGAN+ //// MICH+CARNEGIE	S 8
CLINE	65	PL	15	253	A CLINE,W F FRY ////////////////// WISCONSIN	S 8
DUNAITSE	65	JETP	20	58	DUNAITSEV,PETRUKHIN,PROKOSHKIN + /// DUBNA	S 8
ECKHAUSE	65	PL	15	348	ECKHAUSE,HARRIS,SHULER+// WILLIAM AND MARY	S 8
SHAFER	65	UCRL	16365	THESIS	ROBERT E SHAFER ////////////////////// LRL	S 8
REPLACES	65	PRL	14	923	R E SHAFER,K M CROWE,D A JENKINS ///// LRL	S 8
BARCON	66	PRL	16	775	BARCON,COOL,DORFAN,KRIEGER + //// COLUMBIA	S 8
DEPOMMIE	66		PRIV	COMM	DEPOMMIER,SCERGEL ////////////////////// CERN	S 8
DUNAITSE	66	JINR	P	2534	DUNAITSEV,PEKHTELEV,PROKOSHKIN,SIMO//DUBNA	S 8
KINSEY	66	PR	144	1132	KINSEY,LOSKIEWICZ,NORDBERG //ROCHESTER UNIV	S 8

π^0

9 NEUTRAL PION (135,JPG=0--)I=1

PANOFSKY	51	PR	81	565	W K H PANOFSKY,R L AAMODT,J HADLEY /// LRL	S 9
CASSELS	59	PPS	74	92	CASSELS,JONES,MURPHY,C NEILL /// LIVERPOOL	S 9
CHINOWSK	54	PR	93	966	W CHINOWSKY,J STEINBERGER /////// COLUMBIA	S 9
HADDOCK	55	PRL	3	478	HADDOCK,ABASHIAN,CROWE,CZIRR ////////// LRL	S 9
HILLMAN	59	NC	14	887	HILLMAN,NICOLSKOPP,YAMAGATA,ZAVATTINI/CERN	S 9
BUCAGOV	60	JETP	11	755	BUDAGOV,VIKTOR,OZHELEPOV,ERPOLOV + //JINR	S 9
GLASSER	61	PR	123	1014	R G GLASSER,N SEEMAN,B STILLER ////// NRL	S 9
SAMIOS	61	PR	121	275	N P SAMIOS ////////////////// COLUMBIA+BNL	S 9
SAMIOS	62	PR	126	1844	SAMIOS,PLANO,PROCELL + ////// COLUMBIA+BNL	S 9
TIETGE	62	PR	127	1324	J TIETGE,H PUESCHEL ////// MAX PLANCK INST	S 9
CZIRR	63	PR	130	341	JOHN B CZIRR ////////////////////////// LRL	S 9
KOLLER	63	NC	27	1405	E L KOLLER,S TAYLOR,T HUETTER //// STEVENS	S 9
PETRUKHI	63	SIENA	CONF	208	V I PETRUKHIN,YU D PROKOSHKIN /////// JINR	S 9
VONDARDE	63	PL	4	51	VON DARDEL,DERKERS,MERPOO,VAN PUTTEN+/CERN	S 9
SHWE	64	PR	1368	1636	M SHWE,F M SMITH,W H BARKAS ////////// LRL	S 9
BELLETTI	65	NC	4C	A 1135	BELLETTINI,BEPPOCRAD,BRACCINI+/PISA+FIRENZE	S 9
DUCLOS	65	PL	19	253	DUCLOS,FREYTAG,HEINTZE + //CERN+HEIDELBERG	S 9
EVANS	65	PR	139	B 982	D A EVANS ////////////////////////// CXFORD	S 9

DATA FOR TABLES ON STABLE PARTICLES

CODE	EVENTS ABOVE BACKGROUND	QUANTITY	ERROR+	ERROR-	REFERENCE	YR	TECH	SIGN	COMMENTS	DATE PUNCHED
N ANY SYMBOL IN COLUMN 8 INDICATES DATA IGNORED BY AVERAGING PROGRAMS										

$K^{\pm}$

1C CHARGED K (494,JP=C-) I=1/2

1C CHARGED K MASS (MEV)

S10M		493.9	0.2		COHEN	57	RVUE	+		
S10M		493.7	0.3		BARKAS	63	EMUL	-		
S10M		493.78	0.17		GREINER	65	EMUL	+	V3A TAU DECAY	7/66

1C CHAR.K LIFETIME (UNITS 10**-8)

S10T			0.95	0.36	0.25	ILOFF	56	EMUL		
S10T		52	1.6C	0.3	0.3	EISENBERG	58	EMUL		
S10T			1.21	0.06	0.06	BURROWES	59	CNTR		
S10T		33	1.38	0.24	0.24	FREDEN	60	EMUL		
S10T			1.25	0.22	0.17	BARKAS	61	EMUL		
S10T		51	1.27	0.36	0.23	BHOWMIK	61	EMUL		
S10T		293	1.31	0.08	0.08	NORDIN	61	H BC	-	
S10T	*		1.24	0.07		NORDIN	61	RVUE	-	
S10T			1.221	0.011	0.011	BOYARSKY	62	CNTR	+	
S10T			1.2443	0.0038		FITCH	65	CNTR	+	6/66
S10T			1.2266	0.0036		MELISSINO	66	CNTR	+	8/66

1C CHARGED K PARTIAL DECAY MODES

S10P1	CHAR. K INTO MU (NEU)	K MU	S 4S 2	
S10P2	CHAR. K INTO PI PIO	K PI	S 8S 9	
S10P3	CHAR. K INTO PI PI+ PI-	TAU	S 8S 8S 8	
S10P4	CHAR. K INTO PI 2PIO	TAU PRIME	S 8S 9S 9	
S10P5	CHAR. K INTO MU PIO NEU	K MU	S 4S 9S 2	
S10P6	CHAR. K INTO E PIO NEU	K E	S 3S 9S 1	
S10P7	POSIT.K INTO PI+ PI- E+NEU	K E+	S 8S 8S 3S 1	
S10P8	POSIT.K INTO PI+ PI+ E-NEU	K E-	S 8S 8S 3S 1	
S10P9	POSIT.K INTO PI+ PI- MU+ NEU	K+MU+ 4	S 8S 8S 4S 2	
S10P10	POSIT.K INTO PI+ PI+ MU- NEU	K+MU- 4	S 8S 8S 4S 2	
S10P11	CHAR. K INTO E NEU	K E 2	S 3S 1	
S10P12	CHAR. K INTO MU NEU GAMMA		S 4S 2S 0	
S10P13	CHAR. K INTO PI PIO GAMMA		S 8S 9S 0	
S10P14	CHAR. K INTO PI PI+ PI- GAMMA		S 8S 8S 8S 0	
S10P15	CHAR. K INTO PI E+ E-		S 8S 3S 3	
S10P16	CHAR. K INTO PI MU+ MU-		S 8S 4S 4	

1C CHARGED K BRANCHING RATIOS

S10R N RATIO TO TAU RATE USED WHERE EVER POSSIBLE

S10R1	*	CHAR. K INTO MU NEU (MU2)		(UNITS 10**-2)			(P1)/TOTAL			
S10R1	D		58.5	3.0		BIRGE	56	EMUL	+	
S10R1	D		56.5	2.6		ALEXANDER	57	EMUL	+	
S10R2	*	CHAR. K INTO PI PIO (PI2)				(UNITS 10**-2)			(P2)/TOTAL	
S10R2	D		27.7	2.7		BIRGE	56	EMUL	+	
S10R2	D		23.2	2.2		ALEXANDER	57	EMUL	+	
S10R2			21.0	0.6		CALLAHAN	65	FBC		
S10R2	*		21.6	0.6		TRILLING	65	RVUE		6/66
S10R3	*	CHAR. K INTO PI PI+ PI-(TAU)				(UNITS 10**-2)			(P3)/TOTAL	
S10R3	D		5.6	0.4		BIRGE	56	EMUL	+	
S10R3	D		6.8	0.4		ALEXANDER	57	EMUL	+	
S10R3	D		5.2	0.3		TAYLOR	59	EMUL	+	
S10R3	N	OLD DATA EXCLUDED FOLLOWING SUGGESTION OF TRILLING 65								7/66
S10R3		2232	5.54	0.12		CALLAHAN	64	XBC	+	
S10R3			5.71	0.15		DE MARCO	65	HBC		6/66
S10R3			6.C	0.4		YOUNG	65	EMUL	+	6/66
S10R4	*	CHAR. K INTO PI 2PIC (TAU PRIME)				(UNITS 10**-2)			(P4)/TOTAL	
S10R4	D		2.1	0.5		BIRGE	56	EMUL	+	
S10R4	C		2.2	0.4		ALEXANDER	57	EMUL	+	
S10R4	D		1.5	0.2		TAYLOR	59	EMUL	+	
S10R4	N	OLD DATA EXCLUDED FOLLOWING SUGGESTION OF TRILLING 65								7/66
S10R5	*	CHAR. K INTO MU PIO NEU (MU3)				(UNITS 10**-2)			(P5)/TOTAL	
S10R5	D		2.6	1.C		BIRGE	56	EMUL	+	
S10R5	D		5.5	1.3		ALEXANDER	57	EMUL	+	
S10R5	D		2.8	0.4		TAYLOR	59	EMUL	+	
S10R5	N	OLD DATA EXCLUDED FOLLOWING SUGGESTION OF TRILLING 65								7/66
S10R6	*	CHAR. K INTO E PIO NEU (E3)				(UNITS 10**-2)			(P6)/TOTAL	
S10R6	D		3.2	1.3		BIRGE	56	EMUL	+	
S10R6	C		5.1	1.3		ALEXANDER	57	EMUL	+	
S10R6	N	OLD DATA EXCLUDED FOLLOWING SUGGESTION OF TRILLING 65								7/66
S10R7	*	POSIT.K INTO PI+ PI- E+ NEU				(UNITS 10**-5)			(P7)/TOTAL	
S10R8	*	POSIT.K INTO PI+ PI+ E- NEU				(UNITS 10**-5)			(P8)/TOTAL	
S10R8	*		0.2	CR LESS		BIRGE	65	FBC	+ 95 PER CT CONF	8/66
S10R9	*	POSIT.K INTO PI+ PI- MU+ NEU				(UNITS 10**-5)			(P9)/TOTAL	
S10R9		1	0.77	C.54	-0.50	CLINE	65	FBC	+	8/66
S10R10	*	POSIT.K INTO PI+ PI+ MU- NEU				(UNITS 10**-5)			(P10)/TOTAL	
S10R10	*	0	3.0 CR LESS			BIRGE	65	FBC	+ 95 PER CT CONF	8/66
S10R11	*	CHAR. K INTO E NEU				(UNITS 10**-5)			(P11)/TOTAL	
S10R11	*		16.0 OR LESS			BORREANI	64	HBC	+	8/66
S10R11	*	4	1.9	1.2		BOWEN	66	SPRK	+	8/66
S10R12	*	CHAR. K INTO PI NEU GAMMA				(UNITS 10**-5)			(P12)/TOTAL	
S10R13	*	CHAR. K INTO PI PIC GAMMA				(UNITS 10**-4)			(P13)/TOTAL	
S10R13	*	18	2.2	0.7		CLINE	64	FBC	+ PI+ KE 55-90 MEV	8/66
S10R14	*	CHAR. K INTO PI PI+ PI- GAMMA				(UNITS 10**-4)			(P14)/TOTAL	
S10R14			1.0	C.4		STAHER	65	EMUL	+	8/66
S10R15	*	CHAR. K INTO PI E+ E-				(UNITS 10**-6)			(P15)/TOTAL	
S10R15	*	1	1.1	OR LESS		CAMERINI	64	FBC	+	8/66
S10R16	*	CHAR. K INTO PI MU+ MU-				(UNITS 10**-6)			(P16)/TOTAL	
S10R16			3.0	OR LESS		CAMERINI	65	FBC	+ 90 PER CT CONF	8/66
S10R17	*	CHAR. K INTO (PI PIO)/TAU							(P2)/(P3)	
S10R17			3.26	0.23		ROE	61	XBC	+	8/66
S10R17			4.4C	0.23		SHAKLEE	64	XBC	+	8/66
S10R17		134	3.24	C.34		YOUNG	65	EMUL	+	8/66
S10R18	*	CHAR. K INTO (PI 2PIO)/TAU							(P4)/(P3)	
S10R18			C.30	C.04		ROE	61	XBC	+	8/66
S10R18			0.38	C.04		SHAKLEE	64	XBC	+	8/66
S10R18		2C27	0.303	0.009		BISI	65	H+HL	+	8/66
S10R18		17	0.393	0.059		YCUNG	65	EMUL	+	8/66
S10R19	*	CHAR. K INTO (MU PIO NEU)/TAU							(P5)/(P3)	
S10R19			0.84	0.14		ROE	61	XBC	+	8/66
S10R19			0.59	C.10		SHAKLEE	64	XBC	+	8/66
S10R19		2175	0.632	0.035		BISI	65	H+HL	+	8/66
S10R19		38	0.90	0.16		YCUNG	65	EMUL	+	8/66
S10R19		636	0.567	C.C34		CALLAHAN	66	FBC	+	8/66
S10R20	*	CHAR. K INTO (E PIC NEU)/TAU							(P6)/(P3)	
S10R20			0.88	0.11		ROE	61	XBC	+	8/66
S10R20			0.92	C.08		SHAKLEE	64	XBC	+	8/66
S10R20		23C	0.9C	0.06		BORREANI	64	HBC	+	8/66
S10R2C		37	0.9C	0.16		YCUNG	65	EMUL	+	8/66
S10R20		873	0.722	C.037		CALLAHAN	66	FBC	+	8/66
S10R21	*	POSIT.K INTO (PI+ PI- E+ NEU)/TAU(UNITS 10**-4)							(P7)/(P3)	
S10R21		65	6.7	1.5		BIRGE	65	FBC	+	8/66
S10R22	*	POSIT.K INTO (PI+ PI- MU+ NEU)/TAU(UNITS 10**-4)							(P9)/(P3)	
S10R22	*	1	2.5	APPROX		GREINER	64	EPUL	+	8/66
S10R23	*	CHAR. K INTO (E PIO NEU)/(P2 + P2)(UNITS 10**-2)							(P6)/(P1+P2)	
S10R23		1675	5.89	0.16		CESTER	66	SPRK	+	8/66
S10R24	*	CHAR. K INTO (PI PIO)/(MU NEU)							(P2)/(P1)	
S10R24			0.3253	C.CC62		AUERBACH	66	SPRK	+	8/66
S10R25	*	CHAR. K INTO (E PIO NEU)/(MU NEU)							(P6)/(P1)	
S10R25			0.0796	0.0C54		AUERBACH	66	SPRK	+	8/66
S10R26	*	CHAR. K INTO (MU PIO NEU)/(MU NEU)							(P5)/(P1)	
S10R26			0.0602	C.0043		AUERBACH	66	SPRK	+	8/66
S10R27	*	CHAR. K INTO (MU NEU)/(TAU)							(P1)/(P3)	
S10R27		427	10.38	C.82		YCUNG	65	EMUL	+	8/66

K^{0}

11 NEUTRAL K (JP=0-) I=1/2

11 KO MASS (MEV)

S11M			498.1	C.4		CHRISTENS	64	SPRK		
S11M			497.44	C.33		KIM	65	HBC		6/66
S11M		45CC	498.9	C.5		BALTAY	66	HBC		6/66
S11D			3.9	C.6		ROSENFELD	59	HBC	-	
S11C			5.4	1.1		CRAWFORD	59	HBC	+	
S11D		5	3.5C	C.25		BURNSTEIN	65	HBC	-	
S11C		17	4.1E	C.1E		ENGELMAN	65	HBC		6/66
S11D			3.71	C.35		KIM	65	HBC		6/66

K^{0}_{1}

12 SHORT-LIVED NEUTRAL K (498, JP=0-) I=1/2

12 KC1 LIFETIME (UNITS 10**-10)

S12T		5C	1.07	C.13	C.13	BCLDT	58	CC	
S12T		62	C.81	C.23	0.15	BROWN	58	PBC	
S12T		25	0.84	C.35	0.19	CCCPER	58	CC	
S12T		35	1.15	C.4C	0.25	BLUMENFEL	58	CC	
S12T		259	1.06	0.08	0.06	EISLER	58	PBC	
S12T		512	0.94	0.05	0.05	CRAWFORD	59	HBC	
S12T		62	1.C9	C.1E	0.15	BOWEN	60	CC	
S12T		378	0.94	0.05	0.05	BERTANZA	62	HBC	
S12T		503	0.87	C.C5		CHRETIEN	63	PBC	
S12T		545	0.86	0.04		KREISLER	64	SPRK	
S12T		572	C.91	C.C4		AUERBACH	65	SPRK	6/66
S12T		45CC	C.92	C.C4		BALTAY	66	HBC	6/66
S12T		5CCC	0.843	C.013		KIRSCH	66	HBC	6/66

12 KC1 PARTIAL DECAY MODES

S12P1	KC1 INTO PI+ PI-	S 8S 8
S12P2	KO1 INTO PIO PIO	S 9S 9

12 KO1 BRANCHING RATIOS

S12R1	*	KC1 INTO (PI+ PI-)/TOTAL							(P1)/TOTAL	
S12R1			0.68	C.04		CRAWFORD	59	HBC		
S12R1			C.7C	C.CE		COLUMBIA	60	HBC		
S12R1			C.740	C.024		ANDERSON	62	HBC		
S12R2	*	KC1 INTO (PIC PIO)/TOTAL							(P2)/TOTAL	
S12R2			0.27	C.11		CRAWFORD	59	HBC		
S12R2			0.26	C.06		BAGLIN	60	PBC		
S12R2			0.3C	C.C35		BROWN	61	XBC		
S12R2		1C66	0.339	0.014		BROWN	63	XBC		
S12R2		198	0.288	C.C21		CHRETIEN	63	PBC		
S12R3	*	(KO1 INTO PI+ PI- PIO)/(KO2 INTO PI+ PI- PIC)								
S12R3	*		0.45 OR LESS			BEHR	66	HLBC	90 PER CT CONF	8/66

REFERENCES FOR TABLES ON STABLE PARTICLES

AUTHOR	YR	JOURNAL	VOL.	PAGE	AUTHORS // LABORATORIES	CODE
$K^{\pm}$					10 CHARGED K (494,JP=0-)I=1/2	
BIRGE	56	NC	4	834	BIRGE,PERKINS,PETERSON,STORK,WHITEHEAD//LRL	S10
ILOFF	56	PR	102	927	ILOFF,GELCHABER,LANNUTTI,GILBERT + /// LRL	S10
ALEXANDE	57	NC	6	478	ALEXANDER,JCHASTCN,CCEALLAIGH//DUBLIN INST	S10
COHEN	57	FUND.CONS.		PHYS.	E R COHEN,K P CROWE,J DUPCND // AI+LRL+CIT	S10
EISENBER	58	NC	8	663	EISENBERG,KOCH,LCHRMANN,NIKOLIC + /// BERN	S10
BURROWES	59	PRL	2	117	BURROWES,CALDWELL,FRISCH,HILL + ////// MIT	S10
TAYLOR	59	PR	114	359	S TAYLOR,HARRIS,CREAR,LEE,BAUMEL//CCLUMBIA	S10
FREDEN	60	PR	118	564	S C FREDEN,F C GILBERT,R S WHITE ///// LRL	S10
BARKAS	61	PR	124	1259	BARKAS,DYER,PASCN,NORRIS,NICKOLS,SMIT//LRL	S10
BHOWMIK	61	NC	20	857	B BHOWMIK,P C JAIN,P C MATHUR //DELHI UNIV	S10
NORDIN	61	PR	123	2166	PAUL NORDIN JR ////////////////////////// LRL	S10
ROE	61	PRL	7	346	ROE,SINCLAIR,BROWN,GLASER + ///// MICH+LRL	S10
BOYARSKI	62	PR	128	2358	BOYARSKI,LCH,NIEMELA,RITSCN ////////// MIT	S10
BARKAS	63	PRL	11	26	W H BARKAS,J N DYER,H H HECKMAN ////// LRL	S10
BIRGE	63	PRL	11	35	BIRGE,ELY,GIDAL,CAMERINI + // LRL+WIS+BARI	S10
BORREANI	64	PL	12	123	G BORREANI,G RINAUDO,A WERBROUCK /// TURIN	S10
CALLAHAN	64	PR	136	B 1463	A CALLAHAN,B MARCH,R STARK ///// WISCONSIN	S10
CAMERINI	64	PRL	13	318	CAMERINI,CLINE,FRY,POWELL // WISCONSIN+LRL	S10
CLINE	64	PRL	13	101	D CLINE, W F FRY ////////////// WISCONSIN	S10
GREINER	64	PRL	13	284	D GREINER, W CSECANE, W BARKAS /////// LRL	S10
SHAKLEE	64	PR	136	B 1423	SHAKLEE,JENSEN,ROE,SINCLAIR ///// MICHIGAN	S10
BIRGE	65	PR	139	B 1600	BIRGE,ELY,GIDAL,CAMERINI,CLINE + //LRL+WIS	S10
BISI	65	NC	39	768	BISI,BORREANI,CESTER,FERRARO + /////-TURIN	S10
BISI	65	PR	139	B 1068	BISI,PARZARI-CHIESA,RINAUDO // TURINO,INFN	S10
CALLAHAN	65	PRL	15	129	A CALLAHAN,D CLINE ////////////// WISCONSIN	S10
CAMERINI	65	NC	37	1759	CAMERINI,CLINE,GIDAL,KALPUS,KERNAN/WIS+LRL	S10
CLINE	65	PL	19	253	A CLINE,W F FRY ////////////////// WISCONSIN	S10
DE MARCO	65	PR	140	B 1439	DE MARCO,BRCSSO,RINAUDO ////// TURINO+CERN	S10
FITCH	65	PR	140	B 1088	FITCH,QUARLES,WILKINS //PRINCETON+MT HOLYK	S10
STAMER	65	PR	138	B 440	STAMER,HUETTER,KOLLER,TAYLOR,GRAUMAN//STEV	S10
TRILLING	65	UCRL	16473		GEORGE H TRILLING ////////////////////// LRL	S10
		(THIS IS AN UPDATED VERSION OF REPORT AT 1965 ARGONNE CONF, PAGE 115)				S10
YOUNG	65	UCRL	16362		POH-SHIEK YOUNG (THESIS,BERKELEY) //// LRL	S10
AUERBACH	66	BERKELEY	CONF		AUERBACH + //	S10
BOWEN	66	BERKELEY	CONF		BOWEN + //	S10
CALLAHAN	66	UCRL	16993		CALLAHAN,CAMERINI,MANTHAN,MARCH + //// LRL	S10
CESTER	66	PL	21	343	CESTER,ESCHSTRUTH,CNEILL+ //PRINCETON-PENN	S10
GREINER	65	ANNS	15	67	QUOTED BY BARKAS // LRL	S10
MELISSIN	66	BERKELEY	CONF		MELISSINOS + //	S10
		QUANTUM NUMBER DETERMINATIONS NOT REFERRED TO IN THE DATA CARDS				
BLOCK	62	CERN	CONF	371	BLOCK,LENDINARA,MONARI /////// NNU+BOLOGNA	S10
K^{0}					11 NEUTRAL K (JP=0-)I=1/2	
CRAWFORD	59	PRL	2	112	CRAWFORD,CRESTI,GOOD,STEVENSON,TICHO //LRL	S11
ROSENFEL	59	PRL	2	110	A H ROSENFELD,F SOLMITZ,R D TRIPP //// LRL	S11
CHRISTEN	64	PRL	13	138	CHRISTENSCN,CRONIN,FITCH,TURLAY//PRINCETON	S11
BURNSTEI	65	PR	138	B 895	R A BURNSTEIN,M A RUBIN ////////// MARYLAND	S11
ENGELMAN	65	PRI	CONM		INGLEMAN,FILTHUTH ////////////// HEIDELBERG	S11
KIR	65	PR	140	B 1334	J K KIRZ,L KIRSCH,D MILLER /////// COLUMBIA	S11
BALTAY	66	PR	142	932	BALTAY,SANDWEISS,STONEHILL + //YALE+BNL	S11
K^{0}_{1}					12 SHORT-LIVED NEUTRAL K (498, JP=0-) I=1/2	
BLUMENFE	58	CERN	CONF	272	M BLUMENFELD,W CHINCNSKY,L LEDERMAN//COLUM	S12
BOLDT	58	PRL	1	150	E BOLDT,D O CALDWELL,Y PAL ////////////// MIT	S12
BROWN	58	CERN	CONF	272	J BROWN,D GLASER + ////////////// MICHIGAN	S12
CCCPER	58	CERN	CONF	272	M A CCCPER,M FILTHUTH + ///// JUNGFRAUJUCH	S12
EISLER	58	CERN	CONF	272	F EISLER,R PLANO + // ENL+COL+BOLOGNA+PISA	S12
CRAWFORD	59	PRL	2	266	CRAWFORD,CRESTI,OCUGLASS,GOOD,TICHO +//LRL	S12
BAGLIN	60	NC	18	1043	BAGLIN,BLOCH,BRISSON,HENNESSY + //PARIS EP	S12
BIRGE	60	RCCH	CONF	601	R W BIRGE,P P ELY + //////// LRL+WISCONSIN	S12
BOWEN	60	PR	119	2030	BOWEN,HARDY,REYNOLDS,SUK,MCORE+/PRINCE+BNL	S12
COLUMBIA	60	RCCH	CONF	727	R SCHWARTZ + ////////////////////// COLUMBIA	S12
MULLER	60	PRL	4	418	MULLER,BIRGE,FOWLER,GOOD,PICCIONI+/LRL+BNL	S12
BROWN	61	NC	19	1155	BROWN,BRYANT,BURNSTEIN,GLASER,KADYK+//MICH	S12
FITCH	61	NC	22	1160	V FITCH,P PIRCUE,R PERKINS /// PRINCE+LASL	S12
GOOD	61	PR	124	1223	GOOD,MATSEN,PULLER,PICCIONI + ////////// LRL	S12
ANDERSON	62	CERN	CONF	836	J A ANDERSON,F S CRAWFORD + ////////// LRL	S12
BERTANZA	62	PREPRINT		DICE	BERTANZA,CCNACLLY,CULWICK,EISLER + /// BNL	S12
		(BERTANZA UNPUBLISHED,BUT RECERTIFIED BY AUTHORS,AUGUST 66)				S12
CRAWFORD	62	CERN	CONF	827	F S CRAWFORD ////////////////////////// LRL	S12
BROWN	63	PR	130	765	BROWN,KADYK,TRILLING,RCE + ///LRL+MICHIGAN	S12
CHRETIEN	63	PR	131	2208	CHRETIEN+ //// BRANDEIS+BROWN+HARVARD+ MIT	S12
KREISLER	64	PR	136	B 1074	M KREISLER,O OVERSETH,J CRONIN / PRINCETON	S12
AUERBACH	65	PRL	14	192	AUERBACH,LANDE,MANN,SCIULLI,UTO + /// PENN	S12
FRANZINI	65	PR	140	B 127	FRANZINI,KIRSCH,PLANO + / CCLUMBIA+RUTGERS	S12
TRILLING	65	UCRL	16473		GEORGE H TRILLING ////////////////////// LRL	S12
		(THIS IS AN UPDATED VERSION OF REPORT AT 1965 ARGONNE CONF, PAGE 115)				S12
BALTAY	66	PR	142	932	BALTAY,SANDWEISS,STONEHILL + /// YALE+BNL	S12
KIRSCH	66	NEVIS	146		L KIRSCH,P SCHMIDT ////////////// COLUMBIA	S12

DATA FOR TABLES ON STABLE PARTICLES

CODE	EVENTS ABOVE BACKGROUND	QUANTITY	ERROR+	ERROR-	REFERENCE	YR	TECH	SIGN	COMMENTS	DATE PUNCHED

N ANY SYMBOL IN COLUMN 8 INDICATES DATA IGNORED BY AVERAGING PROGRAMS

K^0_2

13 LONG-LIVED NEUTRAL K (498, JP=0-) I=1/2

13 K2-K1 MASS DIFFERENCE (UNITS OF INVERSE K01 LIFE)

S13D	*		1.9	C.3		FITCH	61	CNTR		
S13D			0.84	C.29	0.21	GCCD	61	PBC		
S13D	*		1.5	0.2		CAPERINI	62	PBC		
S13D			0.5	C.1		CHRISTENS	63	SPRK		
S13D			0.7E	C.2C		AUBERT1	64	PBC		
S13D			0.82	C.12		FUJII	64	SPRK		
S13D			0.47	C.21		ALBERT	65	PBC		6/66
S13D			0.26	C.36	0.26	BALDC-CEO	65	PBC	ASS.CP CONS.	
S13D	*		0.6C	CR LESS		FITCH	65	SPRK	CF. MEISNER 66	7/66
S13D	N		0.82	0.14		VISHNEVSK	65	SPRK		6/66
S13D			0.44	C.C36		ALFF	66	SPRK		6/66
S13D			0.5E	C.1		CHRISTENS	66	SPRK		6/66
S13D			0.48	0.022		BOTT	66	SPRK		6/66
S13D		55	0.6E	C.3C		MEISNER 1	66	HBC		6/66
S13D		+	0.44	C.05		PICCIONI	66	SPRK	PRELIMINARY	8/66
S13D	N	EXPERIMENTS INSENSITIVE TO SMALL D CP WITH NON-GAUSSIAN ERRORS OMITTED								
S13D	N	SIGN OF MASS DIFFERENCE, K02 MINUS K01								
S13D	N	+	45 TO 1 (F) OR 9 TO 1(Y)			MEISNER 2	66	HBC	BETTING ODDS	8/66
S13D	N	+	0.44	C.05		PICCIONI	66	SPRK	EST. STAN. DEV.	8/66

---

13 K2 LIFETIME (NANOSEC)

S13T	*	ASSUMED DS=DC AND DELTA I=1/2				CRAWFORD	59	HBC	
S13T		34	81.0	32.0	24.0	BAROCN	58	CC	
S13T		19	51.C	24.C	13.0	DARPCN	62	PBC	
S13T			54.0	6.C		FUJII	64	SPRK	
S13T		1700	61.	15.0	12.0	ASTBURY	65	CC	8/66

13 K02 PARTIAL DECAY MODES

S13P1	K02 INTO 3PIO	S	9S 9S 9
S13P2	K02 INTO PI+ PI- PIO	S	8S 8S 9
S13P3	K02 INTO PI MU NEUTRINO	S	8S 4S 2
S13P4	K02 INTO PI E NEUTRINO	S	8S 3S 1
S13P5	K02 INTO PI+ PI-	S	8S 8
S13P6	K02 INTO PL+ MU-	S	4S 4
S13P7	K02 INTO E+ E-	S	3S 3
S13P8	K02 INTO E MU	S	3S 4
S13P9	K02 INTO TWO GAMMAS	S	0S 0
S13P10	K02 INTO PI+ PI- GAMMA	S	8S 8S 0
S13P11	K02 INTO PIO PIO	S	9S 9

---

13 K02 DECAY RATES

S13W1	*	K02 INTO PIO PIO PIO			(UNITS 10**6 SEC-1)		(P1)			
S13W1		22	5.1	1.2		BRISSON	64	FBC		
S13W1		54	5.22	1.C3	0.84	BEHR	66	HLBC	ASSUMES CP	8/66
S13W2	*	K02 INTO PI+ PI- PO			(UNITS 10**6 SEC-1)		(P2)			
S13W2		18	3.2E	C177		ANDERSON	65	HBC		8/66
S13W2		14	1.4	C.4		FRANZINI	65	HBC		6/66
S13W2		136	2.62	0.2E	0.27	BEHR	66	HLBC	ASSUMES CP	8/66
S13W3	*	K02 INTO PI E NEUTRINO			(UNITS 10**6 SEC-1)		(P4)			
S13W3			8.1	1.C		AUBERT	65	HLBC		8/66
S13W4	*	K02 INTO CHARGED (3-BODY)			(UNITS 10**6 SEC-1)		(P2+P3+P4)			
S13W4		1C7	14.7	1.E		AUERBACH	65	SPRK	USING NEW K1 LIFE	6/66
S13W5	*	K02 INTO LEPTONIC (KMU3+KE3)			(UNITS 10**6 SEC-1)		(P3+P4)			
S13W5		109	9.4	1.3		FRANZINI	65	HBC		6/66

---

13 K02 BRANCHING RATIOS

S13R1	*	K2 INTO (PIO PIO PIC)/CHARGED						(P1)/(P2+P3+P4)		
S13R1		11C	0.2E	C.C8		ALEKSANYA	64	FBC		6/66
S13R1		24	0.24	C.CE		ANIKINA	64	CC		6/66
S13R1		29	0.21	0.07	0.06	MESTVIRI2	65	CC		6/66
S13R2	*	K2 INTO (PI+ PI- PIO)/CHARGED						(P2)/(P2+P3+P4)		
S13R2		9S	0.1E5	C.C3E		ASTIER	61	CC		8/66
S13R2		7S	0.157	C.C3	C.C4	LUERS	64	HBC		8/66
S13R2		7S	C.151	C.020		ADAIR	64	HBC		8/66
S13R2		6E	0.15	C.03		ASTBURYI	65	CC		8/66
S13R2		32E	0.159	C.C15		ASTBURY 2	65	CC		6/66
S13R2		566	0.178	C.C17		GUIDONI	65	HBC		6/66
S13R2		172S	0.144	0.0C4		MCPKINS	65	HBC		6/66
S13R2		126	0.162	C.015		HAWKINS	66	HBC		6/66
S13R3	*	K02 INTO (PI MU NEUTRINO)/CHARGED						(P3)/(P2+P3+P4)		
S13R3		479	0.356	C.07		LUERS	64	HBC		
S13R3			0.35	C.CE	0.10	ASTBURY 1	65	CC		7/66
S13R4	*	K2 INTO (PI E NEUTRINO)/CHARGED						(P4)/(P2+P3+P4)		
S13R4		479	0.487	0.05		LUERS	64	HBC		
S13R4			0.46	C.CE	0.10	ASTBURY 1	65	CC		7/66
S13R4		59	0.51	0.07		MESTVIRIS	65	CC		6/66
S13R5	*	K02 INTO (PI E NEU)/((PI E NEU)+(PI MU NEU))						(P4)/(P3+P4)		
S13R5		32C	0.415	C.120		ASTIER	61	CC		
S13R6	*	K02 INTO(PI+ PI- PIO)/TOTAL						(P2)/TOTAL		
S13R6		1E	C.1E	C.05		STERN	64	HBC		
S13R7	*	K02 INTO(LEPTON PI NEUTRINO)/TOTAL						(P3+P4)/TOTAL		
S13R7		14	0.5E	0.17		ALEXANDER	62	HBC		
S13R8	*	K02 INTO (2 GAMMA)/TOTAL			(UN. 10**-4)			(P9)/TOTAL		
S13R8			1.3	C.6		CRIEGEE	66	SPRK		8/66
S13R9	*	K02 INTO (PI+ PI-)/CHARGED			(UNIT 10**-3)			(P5)/(P2+P3+P4)		
S13R9	*	C	10.0	OR LESS		NEAGU	61	CC		
S13R9	*	C	15.C	OR LESS		LUERS	64	HBC		
S13R9	*	11	2.5	OR LESS		ABASHIAN	64	SPRK		
S13R9		45	2.0	C.4		CHRISTENS	64	SPRK		
S13R9		54	2.CE	C.3S		GALBRAITH	65	SPRK		
S13R9			1.9T	0.18		CRONIN	65	SPRK		6/66
S13R9			2.22	0.27		CERKERS	66	CNTR		6/66
S13R9			2.052	0.082		DE BOUARD	66	CNTR		6/66
S13R10	*	K02 INTO (PI MU NEU)/(PI E NEU)						(P3)/(P4)		
S13R1C			0.81	C.19		ADAIR	64	HBC		6/66
S13R1C			0.7E	0.15		DE BOUARD	65	CNTR		
S13R11	*	K2 INTO (ML+MU-)/CHARGED			(UNITS 10**-4)			(P6)/(P2+P3+P4)		
S13R11	*		1.0	OR LESS		ANIKINA	65	CC		6/66
S13R11	*		1.0	CR LESS		CARPENTER	65	SPRK		6/66
S13R11	*		2.	CR LESS		DE BOUARD	65	SPRK		8/66
S13R11	*		0.5	CR LESS		ABASHIAN	66	SPRK	90 PER CT CONF	8/66
S13R12	*	K02 INTO (PI+ PI- GAMMA)/TOTAL			(UN. 10**-3)			(P10)/TOTAL		
S13R12	*		15.0	OR LESS		ANIKINA	65	CC		6/66
S13R12	*		3.0	OR LESS		KEFKEAS	66	SPRK		6/66
S13R13	*	K2 INTO (E+ E-)/CHARGED			(UN. 10**-4)			(P7)/(P2+P3+P4)		
S13R13	*		10.0	OR LESS		ANIKINA	65	CC		6/66
S13R13	*		1.0	OR LESS		CARPENTER	65	SPRK		6/66
S13R13	*		1.	OR LESS		DE BOUARD	65	SPRK		8/66
S13R13	*		C.5	CR LESS		ABASHIAN	66	SPRK	90 PER CT CONF	8/66
S13R14	*	K02 INTO (E MU)/CHARGED			(UN. 10**-4)			(P8)/(P2+P3+P4)		
S13R14	*		10.0	OR LESS		ANIKINA	65	CC		6/66
S13R14	*		1.C	CR LESS		CARPENTER	65	SPRK		6/66
S13R14	*		0.5	OR LESS		ABASHIAN	66	SPRK	90 PER CT CONF	8/66
S13R15	*	K02 INTO(E+ PI- NEU)/(E- PI+ NEU)								
S13R15	*		1.			LUERS	64	HBC		
S13R15	*	9T	0.9C	C.1E		NEAGU	61	CC		8/66
S13R15	*	2500	1.CE	C.05		ABASHIAN	66	SPRK		8/66
S13R15	*		1.C1	C.1E		LUERS	64	HBC		8/66
S13R16	*	K2 INTO(MU+ PI- NEU)/(MU- PI+ NEU)								
S13R16	*	3200	1.CC	0.04		ABASHIAN	66	SPRK		8/66
S13R17	*	K02 INTO (PIO PIO)/TOTAL			(UNITS 10**-3)			(P11)/TOTAL		
S13R17		7	1.2	1.5	1.2	CRIEGEE	66	SPRK		7/66

η

14 ETA (549, JPC=0-+) I=0

14 ETA MASS (MEV)

S14M		53	549.C	1.2	BASTIEN	62	HBC
S14M		35	548.C	4.0	PICKUP	62	HBC
S14M		91	548.C	1.0	ALFF	62	HBC
S14M			549.3	2.9	DELCOURT	63	CNTR
S14M		14E	549.C	C.7	FCELSCHE	64	HBC
S14M		325	552.C	3.0	KRAEMER	64	DBC
S14M			548.2	C.6S	FCSTER3	65	HBC
S14M		250	552.C	4.0	JAMES	66	HBC

---

14 ETA WIDTH (MEV)

S14W	*	51	1C CR LESS		ALFF	62	HBC
S14W	*	325	16.C OR LESS		KRAMER	64	DBC
S14W	*	14E	1C CR LESS		FCELSCHE	64	HBC
S14W	*	31	12 OR LESS		JAMES	66	HBC
S14W	*	PI+PI-PIO WIDTH LESS THAN 4.0			BALTAY	66	DBC

---

14 ETA PARTIAL DECAY MODES

S14P1	ETA INTO 2GAMMA	S	0S 0
S14P2	ETA INTO 3PIO	S	9S 9S 9
S14P3	ETA INTO PI+ PI- PIO	S	8S 8S 9
S14P4	ETA INTO PI+ PI- GAMMA	S	8S 8S 0
S14P5	ETA INTO E+E-PIO	S	9S 3S 3
S14P6	ETA INTO E+E-PI+PI-	S	8S 8S 3S 3
S14P7	ETA INTO PIO 2GAMMA	S	9S 0S 0
S14P8	ETA INTO E+E-GAMMA	S	3S 3S 0
S14P9	ETA INTO 2PIO GAMMA	S	9S 9S 0

DATA FOR TABLES ON STABLE PARTICLES

CODE | EVENTS ABOVE BACKGROUND | QUANTITY | ERROR+ | ERROR- | REFERENCE | YR | TECH | SIGN | COMMENTS | DATE PUNCHED

N ANY SYMBOL IN COLUMN 8 INDICATES DATA IGNORED BY AVERAGING PROGRAMS

14 ETA BRANCHING RATIOS

(P9) IS ASSUMED = C IN ALL RATIOS

S14R1	*	ETA INTO NEUTRALS/CHARGED						(P1+P2+P3)/(P3+P4)		
S14R1		1C	2.5	1.0	PICKUP	62	HBC			
S14R1		99	3.2C	1.2E	BASTIEN	62	HBC			
S14R1		91	2.5	C.5	ALFF	62	HBC			
S14R1			2.7	C.E	SHAFER	62	HBC			
S14R1			2.6	.5	BUSCHBECK	63	HBC			7/66
S14R1			2.85	C.56	ALFF-STEI	66	HBC			6/66
S14R1		28C	4.5	1.C	JAMES	66	HBC			6/66
S14R2	*	ETA INTO 2GAMMA/CHARGED						(P1)/(P3+P4)		
S14R2			0.55	0.48	CRAWFORD	63	HBC			
S14R3	*	ETA INTO PIC 2GAMMA/NEUTRALS						(P7)/(P1+P2+P7)		
S14R3			0.375	C.036	DI GIUGNC	66	CNTR			6/66
S14R3			.19	.08	GRUNHAUS	66	SPRK			7/66
S14R4	*	ETA INTC (PI+ PI- GAMMA)/(PI+ PI- PIO)						(P4)/(P3)		
S14R4			0.14	0.08	FOELSCHE	64	HBC			
S14R4		24	0.12	C.25	FALLI	64	CBC			
S14R4			0.30	C.06	CRAWFORD1	66	HBC			6/66
S14R4	N	5	0.27	C.1C	PAULI	64	CBC	CF NCTE N BELOW		6/66
S14R4	N	THE PAULI VALUE BASED ON ONLY 9 EVENTS IS DUE TC CRAWFORD1 66								
S14R4			.10	.10	KRAEMER	64	DBC			7/66
S14R4			.15E	.C41	FOSTER3	65	HBC			7/66
S14R5	*	ETA INTO 3PIO/(PI+ PI- PIC)						(P2)/(P3)		
		FOR THIS RATIO, SEE NOTES ON TABLE S FOLLCWING THIS LISTING								
S14R5			C.83	C.32	CRAWFORD	63	HBC	ASSUM.P1/P2 = 0		7/66
S14R5			2.0	1.0	FOELSCHE	64	HBC	ASSUM.P1/P2 = 0		7/66
S14R5			0.90	C.24	FOSTER1	65	HBC	ASSUM.P1/P2 = 0		7/66
S14R5	N		0.3E	C.1E	CRAWFORD2	66	HBC	ASSUM.(P1)/(P2)=1.8		6/66
S14R5	N		0.41	C.11	FOSTER1	65		ASSUM.(P7)/(P2)=1.8		6/66
	N	GIVEN BY CRAWFORD2 66								
S14R6	*	ETA INTO 2GAMMA/3PIC						(P1)/(P2)		
S14R6	*		1.1	C.3 OR LESS	CHRETIEN	62	PBC			
S14R6			1.1C	C.5	MULLER	63	CBC	ASSUM.P1/P2 = 0		7/66
	N	FOR PRECEDING CARD, SEE NOTES ON TABLE S FOLLCWING THIS LISTING.								
S14R7	*	ETA INTO 2GAMMA/(PI+ PI- PO)						(P11)/(P3)		
S14R7			1.61	C.39	FCSTER	64	HBC			
S14R8	*	ETA INTO NEUTRAL/(PI+ PI- PIO)						(P1+P2+P7)/(P3)		
S14R8		28C	3.6	C.E	KRAEMER	64	EBC			
S14R8			3.8	1.1	PAULI	64	DBC			7/66
S14R9	*	ETA INTO (E+E-PIO)/(PI+PI-PIO) (UNITS 10**-2)						(P5)/(P3)		
S14R9	*	LESS THAN 1.1 1.1			PRICE	65	HBC			
S14R9	*	C 0.77 CR LESS			FCSTER2	65	HBC			
S14R9	*	.9 OR LESS			BAGLIN	66	HLBC			7/66
S14R1C	*	ETA INTC (E+E-PI+PI-)/TCTAL (UNITS 10**-2)						(P6)/TCTAL		
S14R1C	*	0.7 CR LESS			RITTENBER	65	HBC			6/66
S14R11	*	ETA INTC (E+E-PI+PI-)/(PI+PI-GAMMA)						(P6)/(P4)		
S14R11		1	0.026	C.026	GRCSSMAN	66	HBC			6/66
S14R12	*	ETA INTO 2 GAMMA/NEUTRALS						(P13)/(P1+P2+P7)		
S14R12			0.416	0.072	DI GIUGNC	66	CNTR			6/66
S14R12			.47	.C6	GRUNHAUS	66	SPRK			7/66
S14R13	*	ETA INTO 3PIC/NEUTRALS						(P2)/(P1+P2+P7)		
S14R13			0.209	C.027	DI GIUGNC	66	CNTR			6/66
S14R13			.24	.C4	GRUNHAUS	66	SPRK			7/66
S14R14	*	ETA INTC PIO 2GAMMA/2GAMMA						(P7)/(P1)		7/66
S14R14	*	.5 OR LESS			WAHLIG	66	SPRK			7/66
S14R15	*	ETA INTO (E+E-PIC)/TCTAL						(P51/TCTAL		7/66
S14R15	*	0.7 OR LESS			RITTENBER	65	HBC			6/66
S14R16	*	ETA INTO 2GAMMA/(3PIO + PIO 2GAMMA)						(P11)/(P2+P7)		
S14R16			C.6C	.25	BACCI	63	CNTR			7/66

AUTHOR	YR	JOURNAL VOL. PAGE	AUTHORS // LABORATORIES	CODE

K^0_2

13 LONG-LIVED NEUTRAL K (49E, JP=C-) I=1/2

BARCON	68	ANP 5 156	M BAROCA,K LANCE,L LEDERMAN //COLUMBIA+BNL	S13
CRAWFORD	59	PRL 2 361	CRAWFORD,CRESTE,CCUGLASS,GCCD + ////// LRL	S13
ASTIER	61	AIX CONF 1 227	ASTIER,BLASKCVIC,RIVET,SIAUD +/// PARIS+EP	S13
FITCH	61	NC 22 116C	V FITCH,P PIRCUE,R PERRIEN ///// PRINCETON	S13
GCCD	61	PR 124 1223	GCCD,PATSEK,MULLER,PICCIONI,FCWELL +// LRL	S13
ALEXANDE	62	PRL 9 69	G ALEXANDER,S ALPEICA,F CRAWFORD ///// LRL	S13
ANIKINA	62	CERN CONF 452	M M ANIKINA P S ZHURAVIEVA + //// GAS+JINR	S13
CAMERINI	62	PR 128 362	CAMERINI,FRY,GAICOS,BIRGE,ELY +///MISC+LRL	S13
CAPPON	62	PL 2 57	J DARPEN,A ROUSSET,J SIX /////////PARIS+EP	S13
JOVANCVI	63	BNL CONF 42	JCVANCVIC,FISCHER,BURRIS + // BNL+MARYLAND	S13
ABASHIAN	64	PRL 13 243	ABASHIAN,ABRAMS,CARPENTER,FISHER+/ILLINCIS	S13
ADAIR	64	PL 12 67	R K ADAIR,L E LEITUNER ////////// YALE+BNL	S13
ALEKSANY	64	JETP 19 1C19	ALEKSANYAN+/// LEBEDEV+PCS ENG PHYS+EREVAN	S13
ANIKINA	64	JETP 19 42	ANIKINA,ZHURAVLEVA+//GEORG ACAC SCI+ DUBNA	S13
CHRISTEN	64	PRL 13 138	CHRISTENSCN,CRONIN,FITCH,TURLAY //PRINCETN	S13
FUJII	64	PRL 13 253	FUJII,JCVANCVICH,TURKCT,ZORN //BNL+MARYLNC	S13
LUERS	64	PR 133 B 12T6	LUERS,PETTRA,WILLIS,YAMAMOTO ////////// BNL	S13
STERN	64	PRL 12 459	STERN,BINFCPC,LINC,ANDERSCN + /// MISC+LRL	S13
ANIKINA	65	JINR P 2488	ANIKINA,VARDENGA,ZHURAVLEVA,KOTLYA+//DUBNA	S13
ANDERSON	65	PRL 14 475	ANDERSCN,CRAWFORD,GOLDEN,STERN +//LRL+MISC	S13
AUBERT	65	PL 17 59	AUBERT,BEHR,CANAVAN,CHCUKET+///PARIS+ORSAY	S13
ASTBURY1	65	PL 16 80	ASTBURY,FINCCCHIARC,BEUSCH + / CERN+ZURICH	S13
ASTBURY	65	PL 18 175	ASTBURY,MICHELINI,BEUSCH + /// CERN+ZURICH	S13
AUERBACH	65	PRL 14 192	AUERBACH,LANDE,MANN,SCIULLI + ////// PENNA	S13
BALCC-CE	65	NC 38 684	BALCC-CECLIN,CALIPARI,CIAPPCLILLC + /PACVA	S13
BEHR	65	ARGCNNE CONF 59	BEHR,BRISSCN,BELLCTTI+ // EP+MILANO+PADOVA	S13
CARPENTE	65	ARGCNNE CCNF 51	CARPENTER,ABASHIAN,ABRAMS + ///// ILLINCIS	S13
CHRISTEN	65	PR 140 B T4	CHRISTENSCN,CRCNIN,FITCH,TURLAY//PRINCETON	S13
CRONIN	65	ARGCNNE CCNF 1T	FITCH,RCTH,RUSS,VERNON-TC.EE PUB/PRINCETON	S13
FITCH	65	PRL 15 73	FITCH,RCTH,RLSS,VERNCN ////////// PRINCETON	S13
FRANZINI	65	PR 140 B 127	FRANZINI,KIRSCH,PLANO + / CCLUMBIA+RUTGERS	S13
GALBRAIT	65	PRL 14 383	GALBRAITH,PANNING,JCNES +//AERE+BRIST+RHEL	S13
GUIDONI	65	ARGCNNE CONF 49	+BARNES,FCELSCHE,FERBEL,FIRESTC+//BNL+YALE	S13
HOPKINS	65	ARGONNE CONF 67	H W K HOPKINS,BACCN,EESLER // VANC+RUTGERS	S13
MESTVERI	65	JINR P 2445	MESTVERISHVILI,NYAGU,PETROV,RUSAKOV+//JINR	S13
MESTVERI	65	JINR P 2450	MESTVERISHVILI,NYAGU,PETROV,RUSAKOV+//JINR	S13
PRICE	65	PRL 15 123	L R PRICE,F S CRAWFORD ////////////////// LRL	S13
TRILLING	65	UCRL 16473	GEORGE H TRILLING ////////////////////// LRL	S13
		(THIS IS AN UPDATED VERSION OF REPORT AT 1965 ARGONNE CONF, PAGE 119)		S13
ALFF	66	PL 2C 2C7+PRIV CM	ALFF-STEINBERGER,HEUER,KLEINKNECHT+ //CERN	S13
BOTT	66	PRIV COMM	BOTT,ECCENHAUSEN ////////////////////// CERN	S13
CHRISTEN	66	PRIVATE COMMUNICATION CUCTED BY PEISNER 66		S13
		WHICH CORRECTS RESULTS OF		S13
CRIEGEE	66	PRL 17 150	+FOX,FRALEMFELDER,HANSCH,MCSCAT+//ILLINOIS	S13
DEBOUARC	66	PRIV COMM -	DEBOUARC ////////////////////////// CERN	S13
DEKKERS	66	THESES BRUSSELS	D DEKKERS + ////////////////////////// CERN	S13
HAWKINS	66	PL 21 238	C J E HAWKINS ////////////////////////// YALE	S13
PEISNER1	66	PRL 16 278	G W PEISNER,B B CRAWFORD,F CRAWFORD // LRL	S13
PEISNER2	66	UCRL 16628	G PEISNER,B CRAWFORD,F CRAWFORD ////// LRL	S13
NEFKENS	66	PL 19 T06	NEFKENS,ABASHIAN,ABRAMS,CARPENTER+ /// ILL	S13
PICCIONI	66	PRIV. COMMUN.	O PICCIONI,BURNETT,GCCD,SWANSON + /// UCSD	S13

η

14 ETA(549,JPG=0-+)I=0

PEYSNER	61	PRL 7 421	PEYSNER,KRAEMER,NUSSBAUM,RICHARDSON +//JHU	S14
ALFF	62	PRL 9 322	ALFF,BEPLEY,CCLLEY,ERUGGER +///COL+RUTGERS	S14
BASTIEN	62	PRL 8 114	BASTIEN,BERGE,CAHL,FERRC-LUZZI + ///// LRL	S14
CHRETIEN	62	PRL 9 127	CHRETIEN+ //ERAND+BRCWN+HARVARD+MIT+PADOVA	S14
PICKUP	62	PRL 8 329	E PICKUP,RCBINSCN,SALANT ///// NRC+CAN+BNL	S14
SHAFER	62	CERN CONF 307	J SHAFER,FERRC-LUZZI,MURRAY + ///// UC+LRL	S14
BACCI	63	PRL 11 37	BACCI,PENSO,SALVINI + //RCME U+CNEN FRASCA	S14
BUSCHBEC	63	SIENA CCNF 1 166	BUSCHBECK-CZAPP,CCCPER + //VIENNA+CERN+AMS	S14
CRAWFORD	63	PRL 10 546	F S CRAWFORD,LLCYC,FCWLER /////// LRL+DUKE	S14
DELCOURT	63	PL 7 215	DELCOURT,LEFRANCCIS,PEREZ Y JORBA+// ORSAY	S14
MULLER	63	SIENA CCNF 99	MULLER,FAULI + //LPCHE+SACLAY IF+ROME+INFN	S14
FOELSCHE	64	PR 134 B 1138	H W FOELSCHE,M L KRAYBILL ////////// YALE	S14
KRAEMER	64	PR 136 B 496	KRAEMER,MACANSKY,FIELDS + // JHU+NW U+WOOC	S14
PAULI	64	PL 13 351	E PAULI,A MULLER ////////////// LPCHE+SACLAY	S14
PRICE	65	PRL 15 123	L.R.PRICE,F.S.CRAWFORD //LRL	S14
FOSTER1	65	PR 138 B 652	FOSTER,PETERS,PEER,LOEFFLER +//WISC+PURDUE	S14
FCSTER2	65	ATHENS	FCSTER,GCCC,PEER //WISCONSIN	S14
FOSTER3	65	THESIS	M.C.FCSTER //WISCONSIN	S14
RITTENBE	65	PRL 15 556	RITTENBERG,KALBFLEISCH ////////// LRL+BNL	S14
ALFF-STE	66	PR 145 1072	ALFF-STEINBERGER,BERLEY+//CCLUMBIA+RUTGERS	S14
BAGLIN	66	CAR-1-1966	BAGLIN,BEZAGUET,CEGRANGE+ //ECOLE POLY+UC	S14
BALTAY	66	PRL 16 1224	+FRANZINI,KIP,KIRSCH+/COLUMBIA+STONY BROOK	S14
CRAWFRC1	66	PRL 16 333	F.S.CRAWFORD,L.R.PRICE //LRL	S14
CRAWFRD2	66	PRL 16 907	F S CRAWFORD,L LLOYD,E FCWLER //LRL+DUKE	S14
DIGIUGNO	66	PRL 16 767	DIGIUGNO,GIORGI,SILVESTRI+//NAP+TRST+FRASC	S14
JAMES	66	PR 142 896	F E JAMES,M L KRAYBILL ////////// YALE+BNL	S14
GRCSSMAN	66	UCRL 16684	R GROSSMAN,L PRICE,F CRAWFORD /////// LRL	S14
GRUNHAUS	66	THESIS	J.GRUNHAUS //CCLUMBIA	S14
WAHLIG	66	PRL 17 221	WAHLIG,SHIBATA,MANNELLI //MIT+PISA	S14

QUANTUM NUMBERS NOT REFERRED TO IN DATA CARDS

BASTIEN	62	PRL 8 114	BASTIEN,BERGE,CAHL,FERRC-LUZZI,MILLER+/LRL	S14
CARMONY	62	PRL 8 117	D CARMONY,A ROSENFELD,VAN DE WALLE /// LRL	S14
ROSENFEL	62	PRL 8 293	A ROSENFELD,D CARMONY,VAN DE WALLE /// LRL	S14

REFERENCES ON ETA ASYMMETRY PARAMETERS

BALTAY	66	PRL 16 1224	BALTAY,FRANZINI,KIP,KIRSCH+/CCLUM+STONY BK	S14
BEHR	66	PREPRINT	BEHR,BRISSCN,BELLCTTI,AUBERT //PA+MI+PA+OR	S14
CRAWFRD1	66	PRL 16 333	F.S.CRAWFORD,L.R.PRICE //LRL	S14
COLUMBIA	66	UCRL-16693	CCLUMBIA,LRL,PURCUE,WISCCNSIN,YALE	S14
FOWLER	66	BAPS 11 3EC	E.C.FCWLER //DUKE	S14

DATA FOR TABLES ON STABLE PARTICLES

CODE	EVENTS ABOVE BACKGROUND	QUANTITY	ERROR+	ERROR-	REFERENCE	YR	TECN	SIGN	COMMENTS	DATE PUNCHED

N ANY SYMBOL IN COLUMN 8 INDICATES DATA IGNORED BY AVERAGING PROGRAMS

p

1E PRCTCN (938,J=1/2) I=1/2

1E PROTON MASS (MEV)

S16M		938.256	C.CC5		COHEN	65	RVUE		7/66

1E PROTON LIFETIME (UNITS 10**26 YR)

S16T	*	OVER		1.5	BACKENSTC	60	CNTR		
S16T	*	OVER		1.0	GIAMATI	62	CNTR		
S16T	*	OVER		6C.C	KREFP	65	CNTR		6/66

1E PRCTCN MAGNET. MCMENT(E/2MP)

S16MM		2.792763	C.CCCC3C		COHEN	65	RVUE		7/66

n

1N NEUTRON (939,J=1/2) I=1/2

1N NEUTRON-PROTON MASS DIF.(MEV)

S17D		1.2529	C.0CC4		BONDELID	60	CNTR		
S17C		1.2533	C.CCC1		SALGC	64	CNTR		

1N NEUTRCN LIFETIME (UNITS 10**3 SEC)

S17T		1.01	C.03	0.03	SOSNOVSKI	59	FILE		

1N NEUTRON MAGNETIC MCMENT (MAGNETONS,938.2 MEV)

S17MM		-1.91314E	C.CCCC6E		COHEN	56	SPECIAL		7/66

Λ

1E LAMBDA (1115,JP=1/2+) I=0

1E LAMBDA MASS (MEV)

S18M		25	1115.06	C.41	ARMENTERC	62	HBC	SEE NCTE L BELOW	
S18M			1115.27	C.36	BALTAY	62	HBC	SEE NCTE L BELOW	
S18M		317	1115.42	C.13	BHCMPIK	63	RVUE	SEE NCTE L BELOW	
	L	ABOVE LAMBDA MASSES HAVE BEEN RAISED 20 KEV TO ACCOUNT FOR 43 KEV							
	L	INCREASE IN PROTON MASS AND 23 KEV DECREASE IN PION MASS							
S18M	*		1115.4	C.2	BADIER	64	HBC	ERROR IS STATIS.	6/66
S18M	*	635	1115.86	0.05	BALTAY	65	HBC	ERROR IS STATIS.	6/66
S18M			1115.61	C.07	SCHMIDT	65	HBC		6/66
S18M			1115.6	C.1	LCNDCN	66	HBC		6/66

1E *LAMBDA LIFETIME (UNITS 10**-10)

S18T	O	188	2.63	C.21	0.21	BCLDT	58	CC	
S18T	O	74	2.75	C.45	0.38	BLUMENFEL	58	CC	
S18T	O	61	2.C8	C.46	0.31	BRCWN	58	FBC	
S18T	O	4C	3.C4	C.78	C.51	CCCPER	58	CC	
S18T	O	454	2.29	C.13	0.13	EISLER	58	HBC	
S18T	O	625	2.72	C.16	0.16	CRAWFORD	59	HBC	
S18T	O	140	2.72	C.29	C.2T	BOWEN	60	CC	
S18T	O	OLD MEASUREMENTS NOT INCLUDED IN AVERAGE							
S18T	U	746	2.58	C.11	0.11	BEPTANZA	62	HBC	
S18T	-		2.4C	C.28	0.20	C-C CHANG	62	HBC	
S18T	U	3447	2.52	C.CE		FUNG	62	FBC	6/66
S18T		755	2.69	0.11	0.11	HUMPHREY	62	HBC	
S18T		2235	2.36	C.C6	0.C6	BLOCK	63	HEBC	
S18T		706	2.76	C.20		CHRETIEN	63	FBC	
S18T		794	2.55	C.C5		HUBBARD	64	HBC	
S18T		2260	2.31	C.10		KREISLER	64	SPRK	
S18T		1378	2.55	C.C7		SCHWARTZ	64	HBC	
S18T		635	2.51	C.16		BALTAY	65	HBC	6/66
S18T			2.6	0.1		HILL	65	SPRK	
S18T		916	2.35	C.C5		BURAN	66	HLBC	6/66

S18T U UNPUBLISHED MEASUREMENTS (EXCEPT THESES) NOT INCLUDED IN AVERAGE 7/66

S18T N CONTRADICTORY DATA. SEE NOTES ON TABLE S FOLLOWING LISTING.

1E LAMBDA MAGNETIC MCMENT (MAGNETONS,938.2E MEV)

S18MP			-1.5	C.5		CCCL	62	SPRK	
S18MP			0.0	C.6		KERNAN	63	CC	
S18MM		2553	-1.37	C.12		ANDERSON	64	HBC	
S18MM		121	-C.5	0.28		CHARTIERE	65	EMUL	
S18MM		2534	-C.77	C.27		HILL	65	SPRK	

1E LAMBDA PARTIAL DECAY MODES

S18P1	LAMBDA INTO PROTON PI-	S16S 8
S18P2	LAMBDA INTO NEUTRON PIC	S17S 9
S18P3	LAMBDA INTO PROTON MU- NEUTRINO	S16S 4S 2
S18P4	LAMBDA INTO PROTON E- NEUTRINO	S16S 3S 1

1E LAMBDA BRANCHING RATIOS

S18R1	*	LAMBDA INTO (P PI-)/((P PI-)+(N PIO))						(P1)/(P1+P2)
S18R1			0.627	C.C31		CRAWFORD	59	HBC
S18R1			0.65	C.C5		CCLUMBIA	60	HBC
S18R1		503	0.642	0.016		HUMPHREY	62	HBC
S18R1			0.665	C.017		ANDERSCN	62	HBC
S18R2	*	LAMBDA INTO (N PIO)/((P PI-)+(N PIO))						(P2)/(P1+P2)
S18R2			C.23	C.C9		EISLER	57	FBC
S18R2			0.43	C.14		CRAWFORD	59	HBC
S18R2			0.28	C.C8		BAGLIN	60	FEC
S18R2			0.25	C.C5		BRCWN	63	XEC
S18R2		75	0.251	C.034		CHRETIEN	63	FBC
S18R3	*	LAMBDA INTO (P E- NEU)/TOTAL				(UNITS 10**-3)		(P3)/(P1+P2)
S18R3		15	2.C	C.5		HUPPHREY	61	RVUE
S18R3		8	2.9	1.5	1.2	ALBERT	62	FBC
S18R3		15C	0.82	C.12	0.13	ELY	63	FBC
S18R3		2C	1.55	C.34		LIND	64	HBC
S18R3		102	0.78	C.12		BAGLIN	64	FBC
S18R4	*	LAMBDA INTO (P MU- NEU)/TOTAL				(UNITS 10**-4)		(P3)/(P1+P2)
S18R4	*	1	C.2	CR GREATER		GCCC	62	HBC
S18R4	*	1	1.C	OR LESS		ALSTCN	63	FBC
S18R4	*	2	1.0	OR LESS		KERNAN	64	FBC
S18R4	*	BETWEEN 1.3 AND 6.C				LINC	64	HBC
S18R4		3	1.3	C.7		LIND	64	RVUE
S18R4		2	1.5	1.2		RCAKE	64	FBC

1E LAMBDA DECAY PARAMETERS

S18A-	*	ALPHA LAMBDA- (LAMBDA INTO PI- PROTON)							
*S18A-			*0.762*	*0.093*		*MERRILL*	*66*	*HBC*	*8/66*
S18A-			0.62	C.C9		CRONIN	63	CNTR	6/66
S18A-	*		C.682	C.1C4		BERGE	66	HBC	9/66
S18AO	*	ALPHAO /ALPHA- FOR LAMBDA (L INTO PIO N/L INTC PI- P)							
S18AC	*		1.1C	C.27		CCPK	60	CNTR	
S18AE		ALPHA LAMBDA E- (LAMBDA INTC PRCTCN E- NEUTRINC)							
S18AE			0.06	C.19		BARLOW	65	SPRK	7/66
S18B-	*	BETA LAMBDA- (LAMBDA INTO PI- PROTON)							
S18B-			0.18	C.24		CRONIN	63	CNTR	6/66
S18C-	*	GAMMA LAMBDA- (LAMBDA INTO PI- PROTON)							
S18C-			C.7E	C.15		CRONIN	63	CNTR	6/66

Σ+

1S SIGMA+ (1189,JP=1/2+) I=1

1S SIGMA+ MASS (MEV)

S19M			1189.38	C.15		BARKAS	63	EMUL	SEE NCTE S BELOW
S19M		56	1189.43	C.22		BHCMMIK	64	EMUL	SEE NCTE S BELOW
	S	ABOVE SIGMA MASSES HAVE BEEN REDUCED 23 KEV BECAUSE CF LOWER PION MASS							
S19M			1185.5	C.5		BURNSTEIN	64	HBC	
S19M			1185.64	C.11		SCHMIDT	65	HBC	6/66

1S SIGMA+ LIFETIME (UNITS 10**-10)

S19T	*					GLASER	58	RVUE	
S19T		127	C.58	C.16	0.12	PUSCHEL	60	EMUL	
S19T		41	C.82	C.34	0.20	EVANS	60	EMUL	
S19T		117	C.65	C.14	C.11	FREDEN	60	EMUL	
S19T		54	C.8C	C.10	0.C67	KAPLON	60	EMUL	
S19T		23	0.76	C.22	0.14	CHIESA	61	EMUL	
S19T		45	0.75	C.13	0.09	EERTHELOT	61	FBC	
S19T		14C	C.82	C.10	C.C8	BARKAS	61	EMUL	
S19T		192	C.746	C.056	0.052	GPARC	62	HBC	
S19T		454	C.765	C.C4	0.04	HUMPHREY	62	HBC	
S19T		203	C.84	C.12	0.C8	BHCMPIK	64	EMUL	
S19T		181	C.84	C.09		BALTAY	65	HBC	6/66
S19T		900	0.76	C.C3		CARAYANNC	65	HBC	6/66
S19T			C.82	C.C18		CHANC	65	HBC	6/66
S19T		381	0.80	C.C7		COCK	66	SPRK	7/66

1S SIGMA+ MAGNETIC MCMENT (MAGNETONS,938.2E MEV)

S19MM		*44*	*2.7*	*1.2*		*SULLIVAN*	*66*	*EMUL*	+ *PHOTOPRODUCTION* *8/66*
S19MM	*	24	4.3	1.5		MCINTURFF	64	EMUL	
S19MP		381	1.5	1.1		CCCK	66	SPRK	7/66

1S SIGMA+ PARTIAL DECAY MODES

S19P1	SIGMA + INTO PROTON PIC	S16S 9
S19P2	SIGMA + INTO NEUTRON PI+	S1TS 8
S19P3	SIGMA + INTO NEUTRON PI+ GAMMA	S1TS 8S 0
S19P4	SIGMA + INTC LAMBDA E+ NEU	S18S 3S 0
S19P5	SIGMA + INTO PROTON GAMMA	S16S 0
S19P6	SIGMA + INTO NEUTRCN MU+ NEUTRINO	S17S 4S 2
S19P7	SIGMA + INTO NEUTRON E+ NEUTRINO	S1TS 3S 1

CODE	EVENTS	QUANTITY	ERROR+	ERROR-	REFERENCE	YR	TECN	SIGN	COMMENTS	DATE PUNCHED
	ABOVE BACKGROUND									

N ANY SYMBOL IN COLUMN 8 INDICATES DATA IGNORED BY AVERAGING PROGRAMS

1% SIGMA+ BRANCHING RATIOS

S19R1	*	SIGMA+ INTO (NEUTRON PI+)/(NUCLEON PI)						(P2)/(P1+P2)		
S19R1		308	0.490	0.024		HUMPHREY	62	HBC		
S19R1			0.46	0.02		CHANG	65	HBC		6/66
S19R2	*	SIGMA+ INTO (NEUT PI+ GAM)/(PI+N) (UNITS 10**-4) (P3)/(P2)								
S19R2	*	ABOUT		0.4		COURANT	63	HBC		
S19R2	*	26	17.6	3.5		BAZIN 2	65	HBC	OUR ESTIMATE	6/66
S19R3	*	SIGMA+ INTO(LAMBDA E+ NEU)/(PI+N) (UNITS 10**-4) (P4)/(P2)								
S19R3	*	0.3	APPROX.			COURANT	64	HBC		
S19R4	*	SIGMA+ INTO (N MU+/NEU)/(PI+N) (UNITS 10**-4) (P6)/(P2)								
S19R4	*	1 EVENT SEEN,NO RATIO GIVEN.				GALTIERI	62	EMUL		
S19R4	*	C LESS THAN		2.3		BURNSTEIN	63	HBC		
S19R5	*	SIGMA+ INTO (N E+ NEU)/(N PI+) (UNITS 10**-4) (P7)/(P2)								
S19R5	*	C LESS THAN		2.6		BURNSTEIN	63	HBC		
S19R5	*	LESS THAN		4.0		MURPHY	64	PBC		
S19R5	*	1 LESS THAN		1.03		RAUENBERG	64	HBC		
S19R6	*	SIGMA+ INTO (P GAMMA)/(P PIO) (UNITS 10**-3) (P5)/(P1)								
S19R6	*	1	0.66 OR LESS			CARRARA	64	HBC		
S19R6		24	0.37	0.08		BAZIN	65	HBC		
S19R6		4	0.17			CUARENI	65	EMUL		6/66

1% SIGMA+ DECAY PARAMETERS

S19A+	*	ALPHA SIGMA+ (SIGMA + INTO PI+ NEUTRON)							
S19A+		-0.02	0.08		CORK	60	CNTR		
S19A+		-0.20	0.24		TRIPP	62	HBC		
S19A+		+0.014	0.052		BANGERTER	66	HBC	K-P TO SIG+ PI-	7/66
S19AO	*	ALPHA SIGMAO (SIG+ INTO PIC PROTON)							
S19AO		-0.06	0.16		BEALL	62	CNTR		
S19AO		-0.980	0.072		BANGERTER	66	HBC	K-P TO SIG+ PI-	7/66

REFERENCES FOR TABLES ON STABLE PARTICLES

AUTHOR	YR	JOURNAL VOL. PAGE	AUTHORS // LABORATORIES	CODE

p

16 PROTON (938,J=1/2) I=1/2

BACKENSTOSS	60	NC 16 749	BACKENSTOSS,FRAUENFELDER,HYAMS + //// CERN	S16
COHEN	65	RMP 37 537	E R COHEN, J W M DUPOND //// NAASC+CALTECH	S16
KROPP	65	PR 137 B 740	W R KROPP,F REINES ///CASE INST TECHNOLOGY	S16

n

17 NEUTRON (939,J=1/2) I=1/2

COHEN	56	PR 104 283	V W COHEN, CORNOGLE, RAMSEY // BNL+HARVARD	S17
SOSNOVSK	59	JETP 9 717	SOSNOVSKII,SPIVAK,PROKOFEV + // IAE MOSCOW	S17
BONDELID	60	PR 120 687	BONDELID,BUTLER,KENNEDY +//USNRL+CATH UNIV	S17
SALGO	64	NP 53 457	R SALGO, STAUB, WINKLER, ZAPECNI // ZURICH	S17
COHEN	65	RMP 37 537	E R COHEN,CUPONO ///// NAASC+CAL INST TECH	S17

Λ

18 LAMBDA (1115,JP=1/2+) I=0

EISLER	57	NC 5 17CC	EISLER,PLANC,SAMIOS,SCHWARTZ + //COLUM+BNL	S18
BLUMENFE	58	CERN CONF 27C	H BLUMENFELD,W CHINOWSKY,L LEDERMAN//COLUM	S18
BOLOT	58	PRL 1 148	E BOLOT,O D CALCWELL,Y PAL //////////// MIT	S18
BROWN	58	CERN CONF 27C	BROWN,GLASER,GRAVES,PERL,CRONIN + // MICH	S18
COOPER	58	CERN CONF 27C	W A COOPER,H FILTHUTH + ///// JUNGFRAUJOCH	S18
EISLER	58	CERN CONF 27C	F EISLER,PLANC,BASSI + // BNL+COLUM+ECL+PI	S18
CRAWFORD	59	PRL 2 266	CRAWFORD,CRESTI,CCUGLASS,GCOD + ///// LRL	S18
BAGLIN	60	NC 18 1043	BAGLIN,ELCCH,BRISSCN,HENNESSY + //PARIS-EP	S18
BOWEN	60	PR 119 2030	BOWEN,MARCY,REYNOLDS,SUN + ///// PRINCETON	S18
CORK	60	PR 120 1CCC	CORK,KERTH,WENZEL,CRONIN,CCCL //LRL+PR+BNL	S18
COLUMBIA	60	RCCH CONF 726	M SCHWARTZ + //////////////////// COLUMBIA	S18
HUMPHREY	61	PRL 6 478	HUMPHREY,KIRZ,ROSENFELD,RHEE + //LRL+SYRAC	S18
ANDERSCN	62	CERN CONF 232	ANDERSCN,CRAWFORD,GCLDEN,LLOYD + ///// LRL	S18
ARMENTER	62	CERN CONF 236	ARMENTEROS+/CERN+EP+LONDON+BIRM+CEN-SACLAY	S18
AUBERT	62	NC 25 475	AUBERT,BRISSCN,HENNESSY,SIX + /// PARIS-EP	S18
BALTAY	62	CERN CONF 233	BALTAY,FCWLER,SANDWEISS,CULWICK+//YALE+BNL	S18
BERTANZA	62	PREPRINT D105	BERTANZA,CCNACLLY,CULWICK,EISLER + /// BNL	S18
CHANG	62	THESIS DUKE	CHUEN CHUEN CHANG ////////////////////// DUKE	S18
COCL	62	PR 127 2223	CCOL,HILL,MARSHALL + ///// BNL+MIT+NYU+ANL	S18
FUNG	62	BAPS 7 619	SUN YIU FUNG ////////////////////////// LRL	S18
GOCD	62	PRL 9 518	P L GOCD,Y G LIND ////////////////// WISCONSIN	S18
HUMPHREY	62	PR 127 1305	W E HUMPHREY,R R ROSS ////////////////// LRL	S18
ALSTON	63	UCRL 10926	ALSTON,KERZ,NEUFELD,SGLMITZ,WOHLMUT // LRL	S18
BERGE	63	THESIS (BERKELEY)	J PETER BERGE ////////////////////////// LRL	S18
BROWNIK	63	NC 28 1454	B BROWNIK,O F GCYAL ////////////////// CELMI	S18
BLOCK	63	PR 130 766	BLOCK,GESSARCLI,RATTI,KIKUCHI + //NW+ELGNA	S18
BROWN	63	PR 130 769	BROWN,KADYK,TRILLING,RCE + ///LRL+MICHIGAN	S18
CHRETIEN	63	PR 131 2208	CHRETIEN,CRCUCH+///BRANCH+BROWN+HARVARD+MIT	S18
CRONIN	63	PR 129 1795	J W CRONIN,C E CVERSETH //////// PRINCETON	S18
ELY	63	PR 131 868	ELY,GIDAL,KALMUS,CSWALD,POWELL + ///// LRL	S18
KERMAN	63	PR 129 870	KERMAN,MCVEY,MARSHAW,MATTHEWS // ANL+ILL	S18
ANDERSON	64	PRL 13 167	J A ANDERSON,F S CRAWFORD ////////////// LRL	S18
BADIER	64	DUBNA CONF 1 593	BADIER,BARLOUTAUD + ///////EP+SACLAY+AMSTEM	S18
BAGLIN	64	NC 33 977	BAGLIN,BRISSCN,ROUSSET,SIX+ /PARIS+EP+CERN	S18
HUBBARD	64	PR 135 B 183	HUBBARD,BERGE,KALBFLEISCH,SHAFER + /// LRL	S18
KERMAN	64	PR 133 B 1271	KERMAN,POWELL,SANDLER + //LRL+UM-CCLL-LCND	S18
KREISLER	64	PR 136 B 1674	M N KREISLER,C CVERSETH,J CRONIN ///PRINCE	S18
LIND	64	PR 135 B 1483	LIND,BINFORD,CCCC,STERN //////// WISCONSIN	S18
RONNE	64	PL 11 357	RONNE+ /// CERN+EP+UCOL-LONDON+UNIV.BERGEN	S18
SCHWARTZ	64	UCRL 11260 THESIS	JOSEPH ACAR SCHWARTZ ////////////////// LRL	S18
BALTAY	65	PR 140 B 1C27	BALTAY,SANDWEISS,CULWICK,KCPP + //YALE+BNL	S18
BARLON	65	PL 18 64	J BARLON,BLAIR,DUKE,MANN+//CERN+RUTH+PENNA	S18
CHARRIER	65	PL 15 66	CHARRIERE,GIBSON+ //// EPUL+BRIST+CERN+MPI	S18
HILL	65	PRL 15 65	D A HILL,P F LI ////////////////////// MIT	S18
SCHMIDT	65	PR 140 B 1328	P SCHMIDT ////////////////////////// COLUMBIA	S18
BURAN	66	PL 20 318	BURAN,EIVINOSCN,SRJEGGESTAD,TCFTE + //CSLO	S18
LONDON	66	PR 143 1034	LONDON,RAU,GOLDBERG,LICHTMAN+//BNL+SYRACUS	S18
MERRILL	66	BERKELEY CONF	MERRILL,SHAFER,BERGE //LRL	S18
	CF.	66 UCRL 16455	DEANE MERRILL (THESIS, BERKELEY) ///// LRL	S18

Σ^+

1% SIGMA + (1189,JP=1/2+) I=1

GLASER	58	CERN CONF 27C	GLASER,GCCC,MCBRISCN //////////// MICH+LRL	S19
EVANS	60	NC 15 873	BRIST+BRUSS+IAS-U.CCL-DUBLIN+LCN+MILAN+PAD	S19
FREDEN	60	NC 16 611	S FREDEN,H KORNBLUM,R WHITE ////////// LRL	S19
KAPLON	60	ANP 9 139	M KAPLON,A MELISSINOS,YAMANOUCHI // ROCHES	S19
CORK	60	PR 120 1000	CORK,KERTH,WENZEL,CRONIN,CCCL /LRL+PRI+BNL	S19
PUSCHELL	60	NP 20 254	W PUSCHEL ////////////////// MAX PLANCK INST	S19
BARKAS	61	PR 124 1205	BARKAS,DYER,MASON,NICHOLS,SMITH ////// LRL	S19
BERTHELO	61	NC 21 693	BERTHELOT,CAUCIN,GOUSSU + /// SACLAY+ORSAY	S19
CHIESA	61	NC 19 1171	CHIESA,GUASSIATI,RINAUCC ////// INFN-TURIN	S19
BEALL	62	PRL 8 75	BEALL,CORK,KEEFE,MURPHY,WENZEL /////// LRL	S19
GRARD	62	PR 127 807	F GRARD,G A SMITH ////////////////////// LRL	S19
GALTIERI	62	PRL 9 26	GALTIERI,BARKAS,HECKMAN,PATRICK,SMITH//LRL	S19
HUMPHREY	62	PR 127 1305	W E HUMPHREY,R R ROSS ////////////////// LRL	S19
TRIPP	62	PRL 9 66	R D TRIPP,P B WATSON,P FERRO-LUZZI /// LRL	S19
BARKAS	63	PRL 11 26	W H BARKAS,J N DYER,H H HECKMANN ///// LRL	S19
ALSO	61	LCRL 945C	JOHN DYER (THESIS, BERKELEY) /////// LRL	S19
COURANT	63	SIENA CONF 1 15	COURANT,FILTHUTH,BURNSTEIN+ // CERN+PC+NRL	S19
BROWNIK	64	NP 53 22	B BROWNIK,P JAIN,P MATHUR,LAKSHMI // DELMI	S19
BURNSTEI	64	PRL 13 66	BURNSTEIN,CAY,KENCE,SECHI ICRN,SNOW /MARYL	S19
CARRARA	64	PL 12 72	CARRARA,CRESTI,GRIGCLETTC,PERUZZC+//PADOVA	S19
COURANT	64	PR 136 B 1791	COURANT,FILTHUTH+//CERN+FEICLB+MD+NRL +BNL	S19
MCINTURF	64	PRL 13 246	A D MCINTURFF,C E ROOS //////// VANDERBILT	S19
MURPHY	64	PR 134 B 188	C THCMATON MURPHY ////////////////// WISCONSIN	S19
RAUENBER	64	PRL 13 675	RAUENBERG,PARATECK,BLUMENFELD+ /CCL+RUT+PR	S19
ALSO	65	PR 137 B 1105	ALFF,GELAND,BRUGGER,BERLEY+ /COLUM+RUT+BNL	S19
BALTAY	65	PR 140 B 1C2T	BALTAY,SANDWEISS,CULWICK,KCPP + //YALE+BNL	S19
BAZIN	65	PRL 14 154	BAZIN,BLUMENFELD,RAUENBERG +//PRINCE+COLUM	S19
BAZIN	65	PR 140 B 1358	BAZIN,PLANC,SCHMICT + //PRINC+RUTG+CCLUM	S19
CARAYAN	65	PR 138 B 433	CARAYANNCPCULCS,TAUTFEST,WILLMANN// PURDUE	S19
CHANG	65	NEVIS 145 THESIS	CHUNG YUN CHANG ////////////////// COLUMBIA	S19
CUARENI	65	NC 40 A 528	CUARENI,CANTACCI + ////////ECL+FIR+GEN+PARMA	S19
SCHMIDT	65	PR 140 B 1328	P SCHMIDT ////////////////////////// COLUMBIA	S19
BANGERTE	66	PRL TC BE PUBLIS.	BANGERTER,GALTIERI,BERGE,MURRAY+ // LRL	S19
SULLIVAN	66	BAPS 11 767	SULLIVAN,MCTELCHUCK,MCINTURFF,ROOS//VANDER	S19
COOK	66	PRL 17 223	V COCK,EWART,MASEK,CRR,PLATNER//WASHINGTON	S19
		QUANTUM NUMBER DETERMINATIONS NOT REFERRED TO IN THE DATA CARDS		
TRIPP	62	PRL 8 175	R TRIPP,M WATSON,P FERRO-LUZZI /////// LRL	S19
ALFF	63	SIENA CONF 1 205	ALFF,RAUENBERG,KIRSCH,BERLEY+/COLU+RUT+BNL	S19
COURANT	63	SIENA CONF 1 73	COURANT,FILTHUTH,BURNSTEIN,CAY+//CERN+MARY	S19

DATA FOR TABLES ON STABLE PARTICLES

CODE EVENTS QUANTITY ERROR+ ERROR- REFERENCE YR TECH SIGN COMMENTS DATE PUNCHED
ABOVE BACKGROUND

N ANY SYMBOL IN COLUMN 8 INDICATES DATA IGNORED BY AVERAGING PROGRAMS

Σ^-

2C SIGMA- (1198,JP=1/2+) I=1

2C SIGMA- MASS (MEV)

```
S20M          1197.6       C.5          BARKAS    63 EMUL
S20K      586 1197.0       C.2          BURNSTEIN 64 HBC
S20M          1197.43      C.11         SCHMIDT   65 HBC                    6/66
```

2O SIGMA- PASS DIFFER.(-)-(+)(MEV)

```
S20D     2500    0.25       C.25         OCSCH     65 HBC
```

2C SIGMA- LIFETIME (UNITS 10**-10)

```
S20T  *           1.67       C.40    0.28 BROWN     58 PBC
S20T  *           1.89       C.33    0.25 EISLER    58 PBC
S20T  *           1.45       C.12    0.12 CRAWFORD  59 HBC
S20T  *     45    1.35       C.32    0.17 CHIESA    61 EMUL
S20T  *     41    1.75       C.39    0.30 BARKAS    61 EMUL

S20T      1200    1.58       0.06    0.06 HUMPHREY  62 HBC
S20T              1.666      C.C26        CHANG     65 HBC                    6/66
```

2C SIGMA- PARTIAL DECAY MODES

```
S20P1     SIGMA - INTO  NEUTRON PI-                          S17S 0
S20P2     SIGMA - INTO  NEUTRON PI- GAMMA                    S17S 0S 0
S20P3     SIGMA - INTO  NEUTRON MU- NEUTRINO                 S17S 0S 2
S20P4     SIGMA - INTO  NEUTRON E- NEUTRINO                  S17S 0S 1
S20P5     SIGMA - INTO  LAMBDA E- NEUTRINO                   S18S 0S 1
```

2C SIGMA- BRANCHING RATIOS

```
S20R1  *  SIGMA - INTO (N MU- NEU)/(N PI-) (UNITS 10**-3)  (P3)/(P1)
S20R1        22    0.66       0.19         COURANT   64 HBC
S20R1        11    0.56       0.2C         BAZIN     65 HBC                    6/66

S20R2  *  SIGMA - INTO (N E- NEU)/(N PI-)  (UNITS 10**-3)  (P4)/(P1)
S20R2         9    1.0        0.4     0.3  MURPHY    64 PBC
S20R2        16    1.27       C.34         NAUENBERG 64 HBC
S20R2        16    1.15       C.4          MILLER    64 FBC
S20R2        31    1.4        0.3          COURANT   64 HBC


S20R3  *  SIGMA - INTO (LAMBDA E- NEU)/(N PI-) (UNITS 10**-4)(P5)/(P1)
S20R3        11    0.75       C.28         COURANT   64 HBC

S20R4  *  SIGMA - INTO (N PI- GAMMA)/(N PI-) (UNITS 10**-4)(P2)/(P1)
S20R4  *  ABCUT                      C.1     COURANT   63 HBC
S20R4  *     28   11.2        2.1          BAZIN     65 HBC     CUR ESTIMATE   6/66
```

2C SIGMA- DECAY PARAMETERS

```
S2CA-  *  ALPHA SIGMA-
S2CA-            -0.16       0.21         TRIPP     62 HBC
S20A-            -0.010      0.043        BANGERTER 66 HBC     K+P TO SIG+ PI-  7/66
```

Σ^0

21 SIGMA 0 (1193,JP=1/2+) I=1

21 (SIGMA-) - (SIGMA0) PASS DIFFERENCE (MEV)

```
S21D1        16    4.75       C.1          BURNSTEIN 64 HBC
S21D1        37    4.81       C.12         OCSCH     65 HBC
S21D1              4.99       C.12         SCHMIDT   65 HBC                    6/66
```

21 SIGMA0 LIFETIME (UNITS 10**-14)

```
S21T  *     1.0 OR LESS                    DAVIS     62 EMUL
```

21 SIGMA C PARTIAL DECAY MODES

```
S21P1     SIGMA 0 INTO LAMBDA GAMMA                          S18S 0
S21P2     SIGMA 0 INTO LAMBDA E+ E-                          S18S 3S 3
```

Ξ^-

22 XI- (1321,JP=1/2) I=1/2

22 XI- PASS (MEV)

```
S22M  M    11 1317.C       2.2          WANG      61 PBC
S22M  M    18 1317.9       1.9          FOWLER    61 PBC
S22M  M (OLD DATA AND LOW STATISTICS DROPPED ON SUGGESTION OF J R HUBBARD)
S22M  *     1 1322.0       1.3          BROWN     62 HBC     ANTI-XI-       7/66

S22M       62 1321.1       C.65         SCHNEIDER 63 HBC
S22M      517 1321.4.      C.4          JAMEAU    63 FBC
S22M      241 1321.1       C.3          BADIER    64 HBC
S22M  *  ALL MASSES ABOVE MUST BE RAISED 0.09 MEV BECAUSE LAMBDA MASS RAISED
S22M      299 1320.9       C.5          LONDON    66 HBC                    6/66
```

22 XI- LIFETIME (UNITS 10**-10)

```
S22T  M    11    3.5        3.4     1.23 WANG      61 PBC
S22T  M    18    1.28       0.41    0.25 FOWLER    61 PBC
S22T  M (OLD DATA AND LOW STATISTICS DROPPED ON SUGGESTION OF J R HUBBARD)
S22T       517   1.66       0.15    0.14 JAUNEAU   63 FBC
S22T        62   1.55       C.31    0.31 SCHNEIDER 63 HBC
S22T       356   1.77       C.12         CARMONY   64 HBC
S22T       794   1.65       C.07         HUBBARD   64 HBC
S22T       299   1.8C       C.16         LONDON    66 HBC                    6/66
```

22 XI- PARTIAL DECAY MODES

```
S22P1     XI- INTO LAMBDA PI-                                S18S 0
S22P2     XI- INTO LAMBDA E- NEUTRINO                        S18S 3S 1
S22P3     XI- INTO NEUTRON PI-                               S17S 0
S22P4        XI- INTO LAMBDA MU- NEUTRINO                    S18S 4S 2
S22P5        XI- INTO SIGMA0 E- NEUTRINO                     S21S 3S 1
S22P6        XI- INTO,SIGMA0 MU- NEUTRINO                    S21S 4S 2
```

22 XI- BRANCHING RATIOS

```
S22R1  *  XI- INTO (LAMBDA E- NEU)/(LAMBDA PI-)                (P2)/(P1)
S22R1  *     1    0.CC17   OR LESS          CARMONY + 63 HBC QUOTED BY TICHO
S22R1  *          0.0C9    OR LESS          BERGE     66 HBC                  7/66
S22R1  *     1    C.CC6      C.CC6          LONDON    66 HBC                  6/66

S22R2  *  XI- INTO (NEUTRON PI-)/(LAMBDA PI-)                 (P3)/(P1)
S22R2  *          0.005    OR LESS          FERRO-LUZ 63 HBC

S22R3  *     XI- INTO (LAMBDA MU- NEUTRINO)/TOTAL             (P4)/TOTAL
S22R3  *          0.C12    OR LESS          BERGE     66 HBC                  7/66

S22R4  *     XI- INTO (SIGMA0 E- NEUTRINO)/TOTAL              (P5)/TOTAL
S22R4  *          0.CC3    OR LESS          BERGE     66 HBC                  7/66

S22R5  *     XI- INTO (SIGMA0 MU- NEUTRINO)/TOTAL             (P6)/TOTAL
S22R5  *          0.005    OR LESS          BERGE     66 HBC                  7/66
```

22 XI- DECAY PARAMETERS

```
S22A  *  ALPHA XI-

S22A             -0.44       C.11         JAUNEAU   63 FBC
S22A  M    62    -0.72       C.21         SCHNEIDER 64 HBC
S22A  M (OLD DATA AND LOW STATISTICS DROPPED ON SUGGESTION OF J R HUBBARD)
S22A       240   -0.5        0.35         BADIER    64 HBC                  7/66
S22A       356   -0.62       0.12         CARMONY   64 HBC
S22A  * 1C04     -C.368      C.C57        BERGE     66 HBC                  7/66

S22A       364   -C.47       C.12         LONDON    66 HBC  USING A-LAMB =0.62  6/66
S22A      2529   -0.355      0.043        MERRILL   66 HBC  USING A-LAMB=0.T62  8/66

S22B  *  BETA XI-                                                              3

S22B             -0.24       0.53         JAUNEAU   63 FBC
S22B  M    62    0.44        C.36         SCHNEIDER 64 HBC
S22B  M (OLD DATA AND LOW STATISTICS DROPPED ON SUGGESTION OF J R HUBBARD)
S22B       356   0.62        0.16         CARMONY   64 HBC
S22B       364   0.C         0.3          LONDON    66 HBC                  6/66

S22C  *  GAMMA XI-

S22C             C.87        C.C5     0.28 JAUNEAU   63 FBC
S22C       356   0.46        0.28         CARMONY   64 HBC
S22C  M    62    0.52        C.44         SCHNEIDER 64 HBC
S22C  M (OLD DATA AND LOW STATISTICS DROPPED ON SUGGESTION OF J R HUBBARD)
S22C       364   0.88        0.C9         LONDON    66 HBC                  6/66

S22F  *  PHI ANGLE (TAN(PHI)=BETA/GAMMA)  (DEGREE)

S22F              -16.        37.         JAUNEAU   63 FBC
S22F       356    54.C        25.C        CARMONY   64 HBC
S22F  M    62     45.C        2C.C        SCHNEIDER 64 HBC
S22F  M (OLD DATA AND LOW STATISTICS DROPPED ON SUGGESTION OF J R HUBBARD)
S22F  * 1C04      0.45        1C.7         BERGE     66 HBC                  7/66
S22F       2525   1.C         8.0          MERRILL   66 HBC  USING A-LAMB=0.762  8/66
```

CCDE EVENTS QUANTITY ERROR+ ERROR- REFERENCE YR TECN SIGA COMMENTS DATE PUNCHED
ABOVE PACKERONLNC

N ANY SYMBOL IN CCLUMN 8 INDICATES DATA IGNORED BY AVERAGING PROGRAMS

Ξ^0

23 XI C (1314,JP=1/2) I=1/2

23 XI MASS DIFFERENCE (-)-(0)(MEV)

S23D	23	6.8	1.6	JAUNEAU	63 FBC			
S23D	45	6.1	1.6	CARMONY	64 HBC			
S23D	29	6.9	2.2	LONDON	66 HBC			6/66

23 XI C LIFETIME (UNITS 10**-10)

S23T	24	2.5	1.4	C.80	JAUNEAU	63 FBC		
S23T	45	3.9	1.0	0.8	CARMONY	63 HBC		
S23T	101	2.5	C.4	0.3	HUBBARD	63 HBC		

23 XI D PARTIAL DECAY MODES

S23P1	XI C INTC LAMBDA PIO	S18S 9		
S23P2	XI C INTO PROTON PI-	S16S 8		
S23P3	XI C INTO PROTCN E- NEU	S16S 38 1		
S23P4	XI C INTO SIGMA+ E- NEU	S19S 98 1		
S23P5	XI D INTO SIGMA- E+ NEU	S20S 35 1		
S23P6	XI D INTO SIGMA+ MU- NEUTRINC	S19S 45 2		
S23P7	XI D INTO SIGMA- MU+ NEUTRINO	S20S 45 2		
S23P8	XI D INTC PROTON MU- NEUTRINO	S16S 45 2		

23 XI D BRANCHING RATICS

S23R1	* XI D INTC(PROTCN PI-)/(LAMBDA PIO)					(P2)/(P1)		
S23R1	* C	0.C27	OR LESS	TICHC	63 HBC			
S23R1	* C	0.CC5	CR LESS	HUBBARD	66 HBC			T/66
S23R2	* XI C INTO(PROTCN E- NEU)/(LAMBDA PIO)					(P3)/(P1)		
S23R2	* C	0.02T	OR LESS	TICHO	63 HBC			
S23R2	C	C.CC6	CR LESS	HUBBARD	66 HBC			7/66
S23R3	* XI C INTC(SIGMA+ E- NEU)/(LAMBDA PIO)					(P4)/(P1)		
S23R3	* C	0.013	OR LESS	TICHC	63 HBC			
S23R3	C	0.0CT	CR LESS	HUBBARD	66 HBC			T/66
S23R4	* XI D INTO (SIGMA- E+ NEUTRINO)/TOTAL					(P5)/TOTAL		
S23R4	* C	0.CC6	CR LESS	HUBBARD	66 HBC			T/66
S23R5	* XI D INTO (SIGMA+ MU- NEUTRINC)/TCTAL					(P6)/TCTAL		
S23R5	* C	0.CCT	CR LESS	HUBBARD	66 HBC			T/66
S23R6	* XI D INTO (SIGMA- MU+ NEUTRINC)/TOTAL					(P7)/TOTAL		
S23R6	* C	0.006	CR LESS	HUBBARD	66 HBC			T/66
S23R7	* XI D INTO (PROTCN MU- NEUTRINC)/TCTAL					(P8)/TOTAL		
S23R7	* C	0.CC6	CR LESS	HUBBARD	66 HBC			T/66

23 XI C DECAY PARAMETER

S23A	* ALPHA XI C							
S23A	-0.C5	C.42		CARMONY	65 HBC			T/66
S23A	* -0.149	C.154		BERGE	66 HBC			6/66
S23A				LONDON	66 HBC	USING A-LAMB=0.62		6/66
S23A	46 -C.2	C.4		MERRILL	66 HBC	A-LAM=0.690+-.048		6/66
S23A	49C -0.33	C.10						
S23F	* PHI ANGLE XIC (TAN(PHI)=BETA/GAMMA) (DEGREE)							
S23F	N 146 -2.5	23.5		BERGE	66 HBC			T/66
S23F	N 49C 107.0	38.0		MERRILL	66 HBC	USING A-LAMB=0.642		6/66
S23F	N THE LIKELIHOOD FUNCTION FOR COMBINED DATA IS VERY NCN-GAUSSIAN. THE							T/66
S23F	N DATA ARE CONSISTENT (2.2 S.D.) WITH PHI BETWEEN -25 AND +225 DEG.							T/66

Ω^-

24 OMEGA- (1675,JP=3/2+) I=0

S24 * QUANTUM NUMBERS ASSIGNED FROM SU3

24 OMEGA- MASS (MEV)

S24M	* 1 1620.0	25.0	10.0	EISENBERG	54 EPUL			
S24M	S 1 1673.0	8.0		ABRAMS	64 HBC			T/66
S24M	S 1 1686.0	12.0		BARNES 1	64 HBC			T/66
S24M	S 1 1674.0	3.0		BARNES 2	64 HBC			T/66
S24M	S 1 1668.0	8.0		COLLEY	65 HBC			6/66
S24M	S 1 1671.0	5.0		RICHARDSC	65 HBC			T/66
S24M	S ABOVE EVENTS INCLUDED IN SAMIOS RVUE							T/66
S24M	6 1674.0	3.0		SAMIOS	65 RVUE			6/66

24 OMEGA- LIFETIME (UNITS 10**-10 SEC)

S24T	S 1 1.63			ABRAMS	64 HBC			T/66
S24T	S 1 0.7			BARNES 1	64 HBC			T/66
S24T	S 1 1.4			BARNES 2	64 HBC			T/66
S24T	S 1 1.65			COLLEY	65 HBC			T/66
S24T	S 1 1.5			RICHARDSC	65 HBC			T/66
S24T	S ABOVE EVENTS INCLUDED IN SAMIOS RVUE							T/66
S24T	T 1.5	C.5		SAMIOS	65 RVUE			6/66

REFERENCES FOR TABLES ON STABLE PARTICLES

AUTHOR	YR	JOURNAL VCL. PAGE	AUTHCRS // LABCRATCRIES	CODE
Σ^-			20 SIGMA-(1198,JP=1/2+)I=1	
BROWN	56	CERN CONF 27C	BROWN,GLASER,GRAVES,PEPL,CRCNIN + /// MICH	S20
EISLER	56	NC SER10 1C 150	EISLER,BASSI,CCNVERSI + / COL+BNL+BOL+PISA	S20
BROWN	57	PR 108 1036	J BROWN, D GLASER, P PEPL / MICHIGAN + BNL	S20
BARKAS	61	PR 124 1265	BARKAS,DYER,PASCN,NICKOLS,SMITH ////// LRL	S20
CHIESA	61	NC 19 1171	A M CHIESA,B CUASSIATI,G MINAUDO /// TURIN	S20
HUMPHREY	62	PR 127 1305	W E HUMPHREY,P R ROSS ////////////////// LRL	S20
TRIPP	62	PRL 9 66	R D TRIPP,P WATSCN,M FERRO-LUZZI ///// LRL	S20
BARKAS	63	PRL 11 26	W M BARKAS,J N DYER,H H HECKMAN ////// LRL	S20
COURANT	63	SIENA 1 15	COURANT,FILTHUTH,BURNSTEIN+/// CERN+MC+NRL	S20
BURNSTEI	64	PRL 13 66	BURNSTEIN,CAY,KEMCE,SECHI ZCRN,SNCW// MARY	S20
COURANT	64	PR 136 B 1791	COURANT,FILTHUTH+///CERN+HEICL8+MD+NRL+BNL	S20
MILLER	64	PL 11 242	MILLER,STANNARD,BEZAGUET+ /LCNC+PARIS+EERG	S20
MURPHY	64	PR 134 B 188	C THCRNTON MURPHY /////////////// WISCONSIN	S20
NAUENBER	64	PRL 12 679	NAUENBERG,SCHMIDT,MARATECK+ /CCL+RUT+PRINC	S20
BAZIN	65	PR 140 B 1358	BAZIN,PLANC,SCHMIDT + ///PRINC+RUTG+COLUM	S20
CHANG	65	NEVIS 145 THESIS	CHUNG YUN CHANG ////////////////// CCLUMBIA	S20
DOSCH	65	PL 14 239	DOSCH,ENGELMANN,FILTHUTH,HEPP,KLUGE+ /HEID	S20
SCHMIDT	65	PR 140 B,1328	P SCHMIDT ////////////////////// COLUMBIA	S20
BANGERTE	66	PRL TO BE PUBLIS.	BANGERTER,GALTIERI,BERGE,MURRAY+ // LRL	S20
Σ^0			21 SIGMA 0(1193,JP=1/2+)I=1	
DAVIS	62	PR 127 605	D DAVIS,R SETTI,R RAYMCND,G TCMASIN ///CHI	S21
COURANT	63	PRL 10 409	COURANT,FILTHUTH,FRANZINI+//CERN+UMC+USNRL	S21
BURNSTEI	64	PRL 13 66	BURNSTEIN,CAY,KEMCE,SECHI ZCRN,SNOW //MARY	S21
DOSCH	65	PL 14 239	DOSCH,ENGELMANN,FILTHUTH,HEPP,KLUGE+ /HEID	S21
SCHMIDT	65	PR 140 B 1328	P SCHMICT ////////////////////// COLUMBIA	S21
Ξ^-			22 XI - (1321,JP=1/2) I=1/2	
FOWLER	61	PRL 6 134	FCWLER,BERGE,EBERHARD,ELY,GCCD,PCWELL+/LRL	S22
WANG	61	JETP 13 512	K WANG,T WANG,VIRYASCV,TING,SCLOVEV+//JINR	S22
BERTANZA	62	PRL 9 229	BERTANZA,BPISSCH,GOLDBERG,GRAY+/BNL+SYRACU	S22
BROWN	62	PRL 8 255	BROWN,CULWICK,FOWLER,GAILLCUD +///BNL+YALE	S22
FERRCLUZ	63	PR 130 1568	FERRC-LUZZI,ALSTCN,ROSENFELD,WCJCICKI//LRL	S22
JAUNEAU	63	SIENA CONF 4	JAUNEAU+ ///// PARIS+CERN+LCND+RUTH+BERGEN	S22
ALSO	63	PL 4 45	JALNEAU+ ///// PARIS+CERN+LCND+RUTH+BERGEN	S22
SCHNEIDE	63	PL 4 36C	H SCHNEIDER ////////////////////////// CERN	S22
TICHO	63	BNL CONF 410	HARCLC K TICHC ////////////////////// UCLA	S22
CARMONY	64	PRL 12 482	CARMCNY,PJERRCU,SCHLEIN,SLATER,STORK+/UCLA	S22
BACIER	64	CUENA CONF	BACIER,DEPCULIN,BARLCUTAUD+ /PARIS+SAC+ZEE	S22
HUBBARD	64	PR 135 B 183	HUBBARD,BERGE,KALEFLEISCH,SHAFER +/////LRL	S22
PJERROU	65	PRL 14 275	+ SCHLEIN,SLATER,SMITH,STORK,TICHO // UCLA	S22
BERGE	66	PR 147 945	BERGE,EBERHARD,HUBBARD,MERRILL + ///// LRL	S22
LONDON	66	PR 143 1034	LCNDCN,RAU,GCLDBERG,LICHTMAN+//BNL+SYRACUS	S22
MERRILL	66	BERKELEY CCNF	MERRILL,SHAFER,BERGE //LRL	S22
CF.	66	UCRL 16455	DEANE MERRILL (THESIS, BERKELEY) ///// LRL	S22
			QUANTUM NUMBER DETERMINATICNS ACT REFERRED TO IN THE DATA CARDS	
CARMONY	64	PRL 12 482	CARMCNY,PJERROU,SCHLEIN,SLATER,STORK+/UCLA J	S22
SHAFER	65	UCRL 11884	J CUTTER SHAFER, DEANE MERRILL ///// LRL J	S22
MERRILL	66	UCRL 16455	DEANE MERRILL (THESIS, BERKELEY) /// LRL J	S22
Ξ^0			23 XI 0(1314,JP=1/2)I=1/2	
ALVAREZ	59	PRL 2 215	ALVAREZ,EBERHARD,GCOD,GRAZIANC,TICHO+//LRL	S23
JAUNEAU	63	SIENA CONF 1 1	JAUNEAU+ ///// PARIS+CERN+LCND+RUTH+BERGEN	S23
ALSC	63	PL 4 45	JALNEAU+ ///// PARIS+CERN+LCND+RUTH+BERGEN	S23
TICHO	63	BNL CCNF 410	HAROLC K TICHO ////////////////////////UCLA	S23
CARMONY	64	PRL 12 482	CARMCNY,PJERRCU,SCHLEIN,SLATER,STORK+/UCLA	S23
HUBBARD	64	PR 135 B 183	HUBBARD,BERGE,KALEFLEISCH,SHAFER +/////LRL	S23
PJERROU	65	PRL 14 275	+ SCHLEIN,SLATER,SMITH,STORK,TICHO // UCLA	S23
BERGE	66	PR 147 945	BERGE,EBERHARD,HUBBARD,MERRILL + ///// LRL	S23
HUBBARC	66	UCRL 11510	J RICHARD HUBBARD (THESIS,BERKELEY) // LRL	S23
LONDON	66	PR 143 1034	LCNDCN,RAU,GCLDBERG,LICHTMAN+//BNL+SYRACUS	S23
MERRILL	66	BERKELEY CCNF	MERRILL,SHAFER,BERGE //LRL	S23
CF.	66	UCRL 16455	DEANE MERRILL (THESIS, BERKELEY) ///// LRL	S23
			24 CMEGA-(1675,JP=3/2+) I=0	
EISENBER	54	PR 96 581	Y EISENBERG ////////////////////////CORNELL	S24
ABRAMS	64	PRL 13 284	+ BURNSTEIN,GLASSER + ///// PARYLAND+USNRL	S24
BARNES 1	64	PRL 12 204	V E BARNES,CCNNCLLY,CRENNELL,CULWICK+//BNL	S24
BARNES 2	64	PL 12 134	V E BARNES,CCNNCLLY,CRENNELL,CULWICK+//BNL	S24
COLLEY	65	PL 19 152	COLLEY,DCDD + // EER+GLA+IC+MUN+OXF+RHEL	S24
RICHARDS	65	BAPS 10 115	RICHARDSON,BARNES,CRENNEL+ // BNL+SYRACUSE	S24
SAMIOS	65	ARGCNNE CCNF 185	N P SAMIOS ////////////////////// (RVUE) BNL	S24

DATA ON MESON RESONANCES

CODE EVENTS QUANTITY ERROR+ ERROR- REFERENCE YR TECN SIGN COMMENTS DATE
ABOVE BACKGROUND PUNCHED

N ANY SYMBOL IN COLUMN 8 INDICATES DATA IGNORED BY AVERAGING PROGRAMS

σ (390)

7 SIGMA MESON (390,JPG=) I=0
PROBABLY 0(0++)
EVIDENCE NOT COMPELLING, OMITTED FROM TABLE AND LISTING. 7/66
FOR REFERENCES, SEE EARLIER VERSIONS OF UCRL 8030.

S⁰ (720)

14 S0 (PI PI) (700,JPG=0++) I=0

EVIDENCE NOT YET COMPELLING,OMITTED FROM TABLE

14 S0 (PI PI) (700) MASS (MEV)

U14M			700.0		FELDMAN	65	SPRK	
U14M			720.0		HAGOPIAN	65	HBC	
U14M	*		740.0		WOLF	65	RVUE	6/66

14 S0 (PI PI) (700) WIDTH (MEV)

U14W			50.0		FELDMAN	65	SPRK	
U14W			50.0		HAGOPIAN	65	HBC	
U14W	*		90.0		WOLF	65	RVUE	6/66

ω (783)

1 OMEGA (780,JPG=1--) I=0

1 OMEGA MASS (MEV)

U 1M		400	782.0	1.0	ALFF	62	HBC		
U 1M		64	779.4	1.4	ARMENTERO	62	HBC		
U 1M		650	782.0		MURRAY	63	HBC		
U 1M		34	784.0	1.0	ARMENTERO	63	HBC		
U 1M		220	781.0	2.0	KRAEMER	64	DBC		
U 1M			785.6	1.2	MILLER D	65	HBC	SEEN WITH K+K-	
U 1M			780.8	2.0	MILLER D	65	HBC	SEEN WITH K1 K2	8/66
U 1M		333	786.0	1.0	JAMES	66	HBC		6/66

1 OMEGA FULL WIDTH (MEV)

U 1W		34	9.0	3.0	ARMENTERO	63	HBC		
U 1W			13.4	2.0	MILLER D	65	HBC	SEEN WITH K+ K-	
U 1W			11.6	3.0	MILLER D	65	HBC	SEEN WITH K1 K2	8/66
U 1W	*	333	20.0	OR LESS	JAMES	66	HBC		6/66

1 OMEGA PARTIAL DECAY MODES

U 1P1	OMEGA INTO PI+ PI- PIO	S 8S 8S 9	
U 1P2	OMEGA INTO PI+ PI-B	S 8S 8	
U 1P3	OMEGA INTO PI+ PI- GAMMA	S 8S 8S 0	
U 1P4	OMEGA INTO PIO GAMMA	S 9S 0	
U 1P5	OMEGA INTO 2PIO GAMMA	S 9S 9S 0	
U 1P6	OMEGA INTO MU+ MU-	S 4S 4	
U 1P7	OMEGA INTO E+ E-	S 3S 3	
U 1P8	OMEGA INTO ETA GAMMA	S14S 0	
U 1P9	OMEGA INTO ETA PIO	S14S 9	

1 OMEGA BRANCHING RATIOS

U 1R1	*	OMEGA INTO NEUTRAL/(PI+ PI- PIO)						(P4+P5)/(P1)	
U 1R1			0.10	0.04	ALFF	62	HBC		
U 1R1			0.17	0.04	ARMENTERO	63	HBC		
U 1R1		20	0.11	0.02	BUSCHBECK	63	HBC		
U 1R1		35	0.08	0.03	KRAEMER	64	DBC		
U 1R1			0.13	0.035	MILLER D	65	HBC		
U 1R1		348	0.097	0.016	FLATTE	65	HBC		
U 1R1			0.099	0.004	ALFF-STEI	66	HBC		6/66
U 1R1			0.06	0.05 0.02	JAMES	66	HBC		6/66
U 1R2	*	OMEGA INTO (PI+ PI-)/(PI+ PI- PIO)						(P2)/(P1)	
U 1R2	*		0.010 OR LESS		BUTTON	61	HBC		
U 1R2	*		0.02 OR LESS		ALFF	62	HBC		
U 1R2	*		0.07		ALITTI	63	HBC		
U 1R2	*		0.05 OR LESS		ARMENTERO	63	HBC		
U 1R2	*	100	0.05 OR GREATER		FICKINGER	63	HBC		
U 1R2	*		0.02		JAMES	63	HBC		
U 1R2	*	32	0.045	0.016 0.01	MURRAY	63	HBC	NO INTERFERENCE	
U 1R2	*	42	0.006	- 0.002 OR MORE	HUWE	64	HBC	- INTERFERENCE	
U 1R2	*	42	0.11	+ 0.01 OR LESS	HUWE	64	HBC	+ INTERFERENCE	
U 1R2	*		0.05 OR LESS		KRAEMER	64	DBC		
U 1R2	*		0.005 OR LESS		LUTJENS	64	RVUE	NO INTERFERENCE	
U 1R2	*		0.018	0.012 0.006	WALKER	64	RVUE		
U 1R2	*		0.04 OR GREATER		BATON	65	HBC		
U 1R2	*		0.010 OR LESS		CLARK	65	SPRK		6/66
U 1R2			0.029	0.011 0.009	FLATTE	65	HBC	INTERFERENCE	
U 1R2			0.082	0.020	FLATTE	65	HBC	NO INTERFERENCE	
U 1R2	*		0.035 OR LESS		MILLER D	65	HBC		
U 1R3	*	OMEGA INTO (PI+PI-PIO)/(PIO GAMMA)						(P1)/(P4)	
U 1R3	*		8.0	+-1.5 OR LESS	BARMIN	64	PXBC		
U 1R3			10.0	3.0	BELYAKOV	64	PXBC		
U 1R4	*	OMEGA INTO (PI+ PI- GAMMA)/(PI+ PI- PIO)						(P3)/(P1)	
U 1R4	*		0.05 OR LESS		FLATTE	65	HBC		
U 1R5	*	OMEGA INTO(E+ E-)/(PI+ PI- PIO) (UNITS 10**-3)						(P7)/(P1)	
U 1R5	*	3	10.0 OR LESS		MURRAY	63	HBC		
U 1R5	*		3.9	1.3 OR LESS	BARMIN	63	PBC		
U 1R5	*	1	2.8 OR LESS		BEZAGUET	64	FBC		
U 1R5		3	0.20	0.12	BINNIE	65	SPRK		6/66
U 1R5	*		1.4 OR LESS		GALTIERI	65	HBC		
U 1R5		0	0.1	0.12 0.08	ZDANIS	65	SPRK		
U 1R6	*	OMEGA INTO (MU+ MU-)/(PI+ PI- PIO)(UNITS 10**-3)						(P6)/(P1)	
U 1R6	*		1.2 OR LESS		GALTIERI	65	HBC		
U 1R6	*	0	1.0 OR LESS		ZDANIS	65	SPRK		
U 1R7	*	OMEGA INTO (2PIO GAMM)/(PIO GAMMA)						(P5)/(P4)	
U 1R7	*		0.1 OR LESS		BARMIN	64	PXBC		
U 1R8	*	OMEGA INTO(ETA PIO +ETA GAM)/(PI+PI-PIO)						(P8+P9)/(P1)	
U 1R8	*		0.017 OR LESS		FLATTE	65	HBC		

η′ (958)

2 ETA PRIME (960,JPG=0-+) I=0
KNOWN EARLIER AS X0 OR ETA0

2 ETA PRIME MASS (MEV)

U 2M		85	957.0		DAUBER	64	HBC	
U 2M			958.0	1.0	KALBFLEIS	64	HBC	6/66
U 2M			957.0	3.0	BADIER	65	HBC	
U 2M		7	955.0	10.0	COHN	66	DBC	6/66
U 2M			959.0	3.0	LONDON	66	HBC	6/66

2 ETA PRIME WIDTH (MEV)

U 2W	*	85	4.0 OR LESS		DAUBER	64	HBC	
U 2W	*		7.0 OR LESS		KALBFLEIS	64	HBC	6/66
U 2W	*		30.0 OR LESS		BADIER	65	HBC	
U 2W	*		15.0 OR LESS		LONDON	66	HBC	6/66

2 ETA PRIME PARTIAL DECAY MODES

U 2P1	ETA PRIME INTO PI+ PI- ETA	S 8S 8S14
U 2P2	ETA PRIME INTO RHO GAMMA	U 9S 0
U 2P3	ETA PRIME INTO PIO PIO ETA	S 9S 9S14
U 2P4	ETA PRIME INTO PIO E+ E-	S 9S 3S 3
U 2P5	ETA PRIME INTO PI+ PI- E+ E-	S 8S 8S 3S 3
U 2P6	ETA PRIME INTO ETA E+ E-	S14S 3S 3
U 2P7	ETA PRIME INTO PIO RHO 0	S 9U 9
U 2P8	ETA PRIME INTO PIO OMEGA	S 9U 1
U 2P9	ETA PRIME INTO PI+ PI- GAMMA	S 8S 8S 0

2 ETA PRIME BRANCHING RATIOS

U 2R1	*	ETA PRIME INTO (PI+ PI- ETA)/TOTAL						(P1)/TOTAL	
U 2R2	*	ETA PRIME INTO (PI+ PI- ETA NEUTRALS)/TOTAL							
U 2R2		39	0.4	0.1	LONDON	66	HBC		6/66
U 2R3	*	ETA PRIME INTO (RHO GAMMA) / TOTAL						(P2)/TOTAL	
U 2R3	B	35	0.34	0.09	BADIER	65	HBC		
U 2R3	B	CONTROVERSIAL BACKGROUND SUBTRACTION							
U 2R3		20	0.2	0.1	LONDON	66	HBC		6/66
U 2R4	*	ETA PRIME INTO (RHO GAMMA) / (PI PI ETA)						(P2)/(P1+P3)	
U 2R4	*		0.25	0.14	DAUBER	64	HBC		
U 2R5	*	ETA PRIME INTO (PI+ PI- ETA CHARGE0)/TOTAL							
U 2R5		44	0.12	0.02	KALBFLEIS	64	HBC		6/66
U 2R5			0.07	0.04	BADIER	65	HBC		
U 2R5		43	0.10	0.04	LONDON	66	HBC		6/66
U 2R6	*	ETA PRIME INTO (NEUTRALS)/TOTAL							
U 2R6	*		0.24	0.17	BADIER	65	HBC		
U 2R6		54	0.25	0.05	KALBFLEIS	64	HBC		6/66
U 2R6		32	0.3	0.1	LONDON	66	HBC		6/66
U 2R7	*	ETA PRIME INTO (PIO E+ E-)/TOTAL						(P4)/TOTAL	
U 2R7	*		LESS THAN 0.013		RITTENBER	65	HBC		6/66
U 2R8	*	ETA PRIME INTO (PI+ PI- E+ E-)/TOTAL						(P5)/TOTAL	
U 2R8	*		LESS THAN 0.006		RITTENBER	65	HBC		6/66
U 2R9	*	ETA PRIME INTO (ETA E+ E-)/TOTAL						(P6)/TOTAL	
U 2R9	*		LESS THAN 0.011		RITTENBER	65	HBC		6/66
U 2R10	*	ETA PRIME INTO (PIO RHO 0)/TOTAL						(P7)/TOTAL	
U 2R10	*		LESS THAN 0.04		RITTENBER	65	HBC		6/66
U 2R11	*	ETA PRIME INTO (PIO OMEGA)/TOTAL						(P8)/TOTAL	
U 2R11	*		LESS THAN 0.08		RITTENBER	65	HBC		6/66

H (975)

U35 H (975) MASS (MEV)

U35M		90	975.0	15.0	BARTSCH	64	HBC	4.0 PI+ P	8/66

U35 H (975) WIDTH (MEV)

U35W		90	120.0		BARTSCH	64	HBC	4.0 PI+ P	8/66

φ (1019)

4 PHI (1020,JPG=1--) I=0

4 PHI MASS (MEV)

U 4M		1017.0	2.0	ARMENTERO	63	HBC		
U 4M		1019.0	2.0	SCHLEIN	63	HBC	2.0 K- P	
U 4M		1018.6	0.5	MILLER	65	HBC		8/66
U 4M		1020.0	2.0	LONDON	66	HBC		6/66

4 PHI WIDTH (MEV)

U 4W		3.4	1.7	ARMENTERO	63	HBC		
U 4W	* 34	5.0 OR LESS		SCHLEIN	63	HBC		
U 4W		3.5	1.0	MILLER D	65	HBC		8/66
U 4W		6.0	4.0	LONDON	66	HBC		6/66

4 PHI PARTIAL DECAY MODES

U 4P1	PHI INTO K+ K-	S10S10
U 4P2	PHI INTO K01 K02	S11S11
U 4P3	PHI INTO RHO PI	U 9S 8
U 4P4	PHI INTO PI+ PI-	S 8S 8
U 4P5	PHI INTO E+ E-	S 3S 3
U 4P6	PHI INTO MU+ MU-	S 4S 4
U 4P7	PHI INTO PIO GAMMA	S 9S 0
U 4P8	PHI INTO ETA GAMMA	S14S 0
U 4P9	PHI INTO PI+PI-GAMMA	S 8S 8S 0
U 4P10	PHI INTO OMEGA GAMMA	U 1S 0
U 4P11	PHI INTO ETA PI 0	S14S 9
U 4P12	PHI INTO PI+ PI- PI 0	S 8S 8S 9
U 4P13	PHI INTO RHO GAMMA	U 9S 0

CODE	EVENTS QUANTITY ABOVE BACKGROUND	ERROR+	ERROR-	REFERENCE	YR	TECN	SIGN	COMMENTS	DATE PUNCHED

N ANY SYMBOL IN COLUMN 8 INDICATES DATA IGNORED BY AVERAGING PROGRAMS

4 PHI BRANCHING RATIOS

U 4R1	*	PHI INTO (K1 K2)/(K1 K2 AND K+ K-)						(P2)/(P1+P2)	
U 4R1		10	0.40	0.10	SCHLEIN	63	HBC		
U 4R1			0.44	0.04	LINDSEY	66	HBC		8/66
U 4R1			0.41	0.07	LONDON	66	HBC		6/66
U 4R2	*	PHI INTO (RHO PI)/(K KBAR)						(P3)/(P1+P2)	
U 4R2			0.14	0.08	LINDSEY	66	HBC		8/66
U 4R2			0.3	0.15	LONDON	66	HBC		6/66
U 4R3	*	PHI INTO (PI+ PI-)/(K KBAR)						(P4)/(P1+P2)	
U 4R3	*		0.2 OR LESS		LONDON	66	HBC		6/66
U 4R4	*	PHI INTO (E+ E-)/(K KBAR)						(P5)/(P1+P2)	
U 4R4	*		0.0036 OR LESS		GALTIERI	65	HBC		
U 4R5	*	PHI INTO (MU+ MU-)/(K KBAR)						(P6)/(P1+P2)	
U 4R5	*		0.0053 OR LESS		GALTIERI	65	HBC		
U 4R6	*	PHI INTO (PI+PI-GAM)/(K KBAR)						(P9)/(P1+P2)	
U 4R6	*		0.05 OR LESS		LINDSEY	66	HBC		
U 4R7	*	PHI INTO (OMEGA GAM)/(K KBAR)						(P1C)/(P1+P2)	
U 4R7	*		0.09 OR LESS		LINDSEY	66	HBC		
U 4R8	*	PHI INTO (ETA NEUTRALS) / (K KBAR)						(P8+P11)/(P1+P2)	
U 4R8	*		0.15 OR LESS		LINDSEY	66	HBC		
U 4R9	*	PHI INTO (K+ K-)/TOTAL						(P1)/TOTAL	
U 4R9	B		0.26	0.06	BADIER	65	HBC		
U 4R9	B	CONTROVERSIAL BACKGROUND SUBTRACTION							
U 4R9		250	0.48	0.04	LINDSEY	66	HBC		6/66
U 4R10	*	PHI INTO (K1 K2)/TOTAL						(P2)/TOTAL	
U 4R10	B		0.23	0.06	BADIER	65	HBC		
U 4R10	B	CONTROVERSIAL BACKGROUND SUBTRACTION							
U 4R10		170	0.40	0.04	LINDSEY	66	HBC		6/66
U 4R11	*	PHI INTO (PI+ PI- PIO)/TOTAL						(P12)/TOTAL	
U 4R11	B	57	0.51	0.09	BADIER	65	HBC		
U 4R11	B	CONTROVERSIAL BACKGROUND SUBTRACTION							
U 4R11		110	0.14	0.10	LINDSEY	66	HBC		6/66
U 4R12	*	PHI INTO (RHO PI)/TOTAL						(P3)/TOTAL	
U 4R12		30	0.12	0.08	LINDSEY	66	HBC		6/66
U 4R13	*	PHI INTO (PI+ PI- PIO)/(K1 K2)						(P12)/(P2)	
U 4R13	*		0.3 OR LESS		BERLEY	65	HBC		6/66
U 4R14	*	PHI INTO (ETA GAMMA)/TOTAL						(P8)/TOTAL	
U 4R14	*		0.2 OR LESS		BADIER	65	HBC		6/66
U 4R14	*	0	0.08 3R LESS		LINDSEY	66	HBC		6/66
U 4R15	*	PHI INTO (RHO GAMMA) / TOTAL						(P13)/TOTAL	
U 4R15	*	0	0.02 OR LESS		LINDSEY	66	HBC		8/66
U 4R16	*	PHI INTO (OMEGA GAMMA) / TOTAL						(P10)/TOTAL	
U 4R16	*	0	0.05 OR LESS		LINDSEY	66	HBC		8/66

$K\bar{K}_0$ (1068)

3 K KBAR)0 (1068,JPG=0++) I=0

NAMED S* BY CRENNELL ET AL.
MAY BE JUST LARGE S-WAVE SCATTERING LENGTH

3 K KBAR)0 MASS (MEV)

U 3M	*	16	1020.0		ALEXANDER	62	HBC		
U 3M	*		1000.0	APPROX	BINGHAM	62	PBC		
U 3M	*		1000.0	APPROX	BIGI	62	HBC		
U 3M	*	30	1030.0	APPROX.	BALTAY	64	HBC		
U 3M	*		1025.0	APPROX.	BARMIN	64	HLBC		6/66
U 3M		20	1068.0	10.0	CRENNELL	66	HBC	6.0 PI- P	6/66

3 K KBAR)0 WIDTH (MEV)

U 3W		20	80.0	15.0	CRENNELL	66	HBC		6/66

3 K KBAR)0 PARTIAL DECAY MODES

U 3P1	KKBAR)0 INTO K KBAR	S12S12	
U 3P2	KKBAR)0 INTO PI PI	S 9S 9	

3 K KBAR)0 BRANCHING RATIOS

U 3R1	*	KKBAR)0 INTO (PI PI)/(K KBAR)						(P1)/(P2)	
U 3R1	*		2.5 OR LESS		CRENNELL	66	HBC	90 PCT CONF LEV	7/66

REFERENCES ON MESON RESONANCES

AUTHOR	YR	JOURNAL	VOL.	PAGE	AUTHORS // LABORATORIES	CODE

$S^0(720)$

14 SC EFI PI)(700,JPG=0++) I=0

CCHN	65	PRL	15	506	H O CCHN,BUGG+//CRNL+TENN+UNCAR+CCLU+EFINS U14
CORBETT	65	NC	35	979	CORBETT,DAHERELL,PIDDLEMAS,CLEG+//CXF+RHEL U14
FELDMAN	65	PRL	14	869	FELDMAN,FRATT,HALPERN,CHCUDRY+/PENNA+CCLUN U14
HAGOPIAN	65	PRL	14	1077	HAGOPIAN,SELOVE,ALEX+/PENNA+SACLAY+BOLOGNA U14
WOLF	65	PL	16	328	G WOLF ////////////////////////////////// DESY U14

$\omega(783)$

1 OMEGA (780,JPG=1--) I=0

PAGLIC	61	PRL	7	178	B MAGLIC,ALVAREZ,ROSENFELD,STEVENSON //LRL U 1
PEYSER	61	PRL	7	421	PEYSER,KRAEMER,RUSSBAUM,RICHARD+////JHU+NW U 1
XUONG	61	PRL	7	327	NGUYEN HUU XUONG,GERALD R LYNCH ///// LRL U 1
ALFF	62	PRL	9	325	ALFF,BERLEY,CCLLEY,GELFAND +//COLU+RUTGERS U 1
ARMENTER	62	CERN	CONF	50	R ARMENTEROS,R BUCCE + // CERN+CCLL+FRANCE U 1
BLITTCN	62	PR	126	1858	BLITTCN,KALBFLEISCH,LYNCH,MAGLIC + /// LRL U 1
STEVENSC	62	PR	125	687	STEVENSCN,ALVAREZ,PAGLIC,PCSENFELC /// LRL U 1
ALITTI	63	NC	25	515	ALITTI,BATCN,BERTHELCT+//LPCHE+PAR+BARI+BO U 1
ARMENTER	63	SIENA	CONF	1 256	ARMENTEROS,EDWARES,JACCBSEN+ // CERN+PARIS U 1
BARBIN	63	SIENA	CONF	1 207	BARBIN,CCLGCLENKC,KRESTNIKCV+ ////// ITEP U 1
BERTHELD	63	SIENA	CONF	2 6C	A BERTHELCT ////////////// CEN-SACLAY U 1
BUSCHBEC	63	SIENA	CONF	1 166	BUSCHBECK,CZIAPP+ /// VIENNA+CERN+AMSTERDAM U 1
FICKINGE	63	PRL	10	467	B J FICKINGER,C K PCEINSCH,E SALANT // BNL U 1
JAMES	63	PREPR.	TID-19082		F E JAMES, M L KRAYBILL ////////////// YALE U 1
PURRAY	63	PL	7	358	PURRAY,FERRCLUZZI,HUWE,SHAFER,SOLMITZ+/LRL U 1
SHAFER	63	STANFORD	CONF	366	J SHAFER,J PURRAY,M FERRC-LUZZI,D HUWE/LRL U 1
BARBIN	64	JETP	18	1285	BARBIN,COLGCLENKC,KRESTNIKCV + ///// ITEP U 1
BELYAKOV	64	DUBNA	CONF		BELYAKCV + ////////////////// DUBNA+BUCHAREST U 1
BEZAGUET	64	PL	12	70	BEZAGLET,NGUYEN KHAC,RCUSSET+//PAR+EERE+LC U 1
HUWE	64	UCRL	11291	THESIS	DARRELL C HUWE ////////////////////// LRL U 1
KRAEMER	64	PR	136	B 496	KRAEMER,MACANSKY,PEER,FIELDS+//JHU+NW+WCDC U 1
LUTJENS	64	PRL	12	317	G LUTJENS,J STEINBERGER /////// CCLUMBIA U 1
WALKER	64	PL	8	208	WALKER,BCYC,ERWIN,SATTERBLCM +// WISCONSIN U 1
BATCN	65	NC	35	713	BATCN,BERTHELCT,CELER,BENEDETTI+//SAC+BCLOG U 1
BIANIE	65	PL	18	348	BIANIE,DUANE,JANE,W JONES+//IC-LCND+MANCHS U 1
					[illegible] U 1
FLATTE	65	PRL	14	1059	FLATTE,HUWE,MURRAY,SHAFER,SCLMITZ +/// LRL U 1
GALTIERI	65	PRL	14	275	A BARBARC GALTIERI,R O TRIPP ///////// LRL U 1
MILLER	65	CU-237	(NEVIS 131)		DAVIC C MILLER (THESES) /////// CCLUMBIA U 1
MILLER	65	INCLUDES DATA OF			GELFAND 65 BELCW U 1
GELFAND	65	PRL	11	436	GELFAND,MILLER,RUSSBAUM,RATAU+ /CCLUM+RUTG U 1
ZDANIS	65	PRL	14	721	ZDANIS,MACANSKY,KRAEMER,+BERTZBACH+/JHU+BNL U 1
ALFF-STE	66	PR	145	1072	ALFF-STEINBERGER,BERLEY,BRUCCER+//CCL+RUTG U 1
JAMES	66	PR	142	896	F E JAMES,KRAYBILL ////// YALE+BROOKHAVEN U 1

$\eta'(958)$

2 ETA PRIME (960,JPG=0-+) I=0

CAUBER	64	DUBNA	CONF	1 416	CAUBER,SLATER,L T SMITH,STORK,TICHO //UCLA U 2
CALBER 2	64	PRL	13	445	CALBER,SLATER,SMITH,STORK,TICHO ///// UCLA U 2
KALBFLEI	64	DUBNA	CONF	1 414	G R KALBFLEISCH,C CAHL,A RITTENBERG // LRL U 2
BACIER	65	PL	17	337	BACIER,DEPCULIN,BARLOUTAUD +/PAR+SAC+ZEEMA U 2
KIENZLE	65	PL	19	436	KIENZLE,MAGLIC,LEVRAT,LEFEEVRES + /// CERN U 2
RITTENBE	65	PRL	15	556	RITTENBERG,KALBFLEISCH ////////// LRL+BNL U 2
CCHN	66	PL	21	347	CCHN,PCCULLCCH,BUGG,CCNCC//CRNL+TENN+UNCAR U 2
LCNDCN	66	PR	142	1034	LCNDCN,RAU,SAMICS,GCLDBERG +//BNL+SYRACUSE U 2

H (975)

L35 H (975, JPG=) I=0

BARTSCH	64	PL	11	167	AACHEN-ZEUTHEN-BIRP-BCNN-HAMB-MUNCHEN CCLL U35

$\phi(1019)$

4 PHI (1020,JPG=1--) I=0

BERTANZA	62	PRL	9	180	BERTANZA,BRISSCN,CCNNCLLY,HART + //BNL+SYR U 4
ARMENTER	63	SIENA	CONF	2 70	ARMENTEROS,EDWARES,ASTIER+//CERN+CDF-PARIS U 4
SCHLEIN	63	PRL	10	368	SCHLEIN,SLATER,SMITH,STORK,TICHO //// UCLA U 4
BACIER	65	PL	17	337	BACIER,DEPCULIN,BARLOUTAUD+//PAR+LPCHE+ZEE U 4
BERLEY	65	PR	139	B 1057	D BERLEY,A GELFAND ////////// BNL+CCLUMBIA U 4
CALTIERI	65	PRL	14	275	A BARBARC CALTIERI,R C TRIPP ///////// LRL U 4
MILLER	65	CU-237	(NEVIS 131)		DAVIC C MILLER (THESES) /////// CCLUMBIA U 4
MILLER	65	INCLUDES DATA OF			GELFAND 65 BELCW U 4
GELFAND	65	PRL	11	436	GELFAND,MILLER,RUSSBAUM,KIRSCH+//CCLU+RUTG U 4
LINDSEY	66	PR	147	913	JAMES S LINDSEY, GERALD A SMITH //// LRL U 4
LINDSEY	66	INCLUDES DATA OF			LINDSEY 65 ANC 66 BELCW U 4
LINDSEY	65	PRL	15	221	JAMES S LINDSEY,GERALD A SMITH /////// LRL U 4
LINDSEY	66	PL	20	53	J S LINDSEY,G A SMITH ////////////////// LRL U 4
LCNDCN	66	PR	142	1034	LCNDCN,RAL,SAMICS,GCLDBERG +//BNL+SYRACUSE U 4

$K\bar{K}_0$ (1068)

K KBAR)C (1068,JPG=0++) I=0

ALEXANDE	62	PRL	9	460	ALEXANDER,CAHL,JACCBS,KALBFLEISCH + // LRL U 3
BIGI	62	CERN	CONF	247	A BIGI,S BRANCT, B CARRARA + /////// CERN U 3
BINGHAM	62	CERN	CCNF	240	H H BINGHAM,P BLCCH + ///PARIS+BC POLY+CERN U 3
ERWIN	62	PRL	9	34	ERWIN,MCYER,PARCH,WALKER,WANGLER //WIS+BNL U 3
BALTAY	64	DUBNA	CONF	1 409	BALTAY,LACH,CRENNELL,CREN,STUPF +/YALE+BNL U 3
BARBIN	64	DUBNA	CONF	1 433	BARBIN,CCLGCLENKC,YERCFEEV,KRESTNI+// ITEP U 3
CRENNELL	66	PRL	16	1025	CRENNELL,KALBFLEISCH,LAI,SCARR,SCHU+ //BNL U 3

DATA ON MESON RESONANCES

CODE — EVENTS ABOVE BACKGROUND — QUANTITY — ERROR+ — ERROR- — REFERENCE — YR — TECN — SIGN — COMMENTS — DATE PUNCHED

N ANY SYMBOL IN COLUMN 8 INDICATES DATA IGNORED BY AVERAGING PROGRAMS

f (1254)

5 F (1250,JPC=2++) I=0

5 F MASS (MEV)

U 5M		1250.0	25.0		SELOVE	62	HBC			
U 5M		1260.0	35.0		VEILLET	63	FBC			
U 5M		5 1250.0			GUIRAGOSS	63	HBC			
J 5M		5 1260.0			BONDAR	63	HBC			
U 5M		1250.0			LEE	64	HBC			
U 5M		110 1250.0			CHUNG	65	HBC	3.2 PI- P		8/66
U 5M		1240.0	20.0		ACCENSI	66	HBC			6/66
U 5M		1275.0	25.0		WAHLIG	66	SPRK			6/66

5 F WIDTH (MEV)

U 5W		100.0	25.0		SELOVE	62	HBC			
U 5W	•	200.0	OR LESS		VEILLET	63	FBC			
J 5W		85 160.0			BONDAR	63	HBC			
U 5W		130.0	20.0		LEE	64	HBC			
U 5W		110 110.0	10.0		CHUNG	65	HBC	3.2 PI-+P		8/66
U 5W		102.0	46.0		ACCENSI	66	HBC			6/66

5 F PARTIAL DECAY MODES

U 5P1	F	INTO PI+ PI-	S 8S 8
U 5P2	F	INTO 2PI+ 2PI-	S 8S 8S 8S 8
J 5P3	F	INTO K KBAR	S12S12

5 F BRANCHING RATIOS

U 5R1	•	F INTO (4PI)/(2PI)					(P2)/(P1)		
U 5R1		0.08	0.06		BONDAR	63	HBC		
J 5R1	•	0.04	OR LESS		CHUNG	65	HBC		
U 5R2	•	F INTO (K KBAR)/(PI PI)					(P3)/(P1)		
U 5R2	•	0.16	OR LESS		WANGLER	65	HBC		
J 5R2	•	0.04	OR LESS		CHUNG	65	HBC		
U 5R2	•	0.05	OR LESS		DEUTSCHMA	66	HBC		6/66

J 5R *FOR 2+ NONET SU3 RATES SEE E.G. GLASHOW,SOCOLOW, PRL 15,329(65)

D (1286)

8 D MESON (1285,JPG=) I=0

JPG DISCUSSED AT OXFORD, SEE ROSENFELD 65

8 D MESON MASS (MEV)

U 8M		1280.0	10.0		MILLER D	65	HBC		
J 8M		1290.0	8.0		D.ANDLAU	65	HBC		

8 D MESON WIDTH (MEV)

U 8W		40.0	10.0		MILLER D	65	HBC		
U 8W	•	25.0	APPROX.		D.ANDLAU	65	HBC		

8 D MESON PARTIAL DECAY MODES

U 8P1		D MESON INTO K KBAR PI	S1CS12S 8

8 D MESON BRANCHING RATIOS

U 8R *FOR 1+ NONET SU3 RATES SEE E.G. SHEN+, UCRL 16530(66) SUBM. TO PRL

E (1418)

6 E MESON (1410,JPG=) I=0,1

6 E MESON MASS (MEV)

J 6M		316 1413.0	15.0		ARMENTERO	64	HBC	0		6/66
U 6M		1420.0	10.		MILLER D	65	HBC			

6 E MESON WIDTH (MEV)

U 6W		316 70.0	15.0		ARMENTERO	64	HBC	0		6/66
U 6W		60.0	10.0		MILLER D	65	HBC			

6 E MESON BRANCHING RATIOS

U 6R *FOR 1+ NONET SU3 RATES SEE E.G. SHEN+, UCRL 16930(66) SUBM. TO PRL

f' (1500)

13 F PRIME (1500,JPG=2++) I=0

13 F PRIME(1500) MASS (MEV)

U13M	•	32 1500.0			BARNES	65	HBC	5.0 K- P		
U13M	•	14 1480.0			CRENNELL	66	HBC	6.0 PI- P		8/66

13 F PRIME(1500) WIDTH (MEV)

U13W	•	80.0	APPROX.		BARNES	65	HBC		

13 F PRIME PARTIAL DECAY MODES

U13P1		F PRIME INTO PI+ PI-	S08S08
U13P2		F PRIME INTO K KBAR	S12S12
U13P3		F PRIME INTO K K*(890)	S10C18

13 F PRIME BRANCHING RATIOS

J13R1	•	F PRIME INTO (PI+ PI-)/(K KBAR + K K*(8SC)) (P1)/(P2+P3)							
U13R1	N	19	1.0 OR LESS		BARNES	63	HBC		
U13R1	N	SU3	.03 ESTIMATE FROM SU3 GLASHOW			63	SU3		
J13R2	•	F PRIME INTO (K KBAR) / TOTAL					(P2)/TOTAL		
U13R2		0.64	0.31		GOLDBERG	66			8/66

J13R *FOR 2+ NONET SU3 RATES SEE E.G. GLASHOW,SOCOLOW, PRL 15,329(65)

ρ (756)

9 RHO (750,JPG=1-+) I=1

9 RHO MASS (MEV)

U 9M+		610 770.0	10.0		ALFF	62	HBC	+		
J 9M+	C	760.0	9.0		CARMONY	64	HBC	+		
U 9M+	C	CARMONY MASS CALCULATED FOR MOMENTUM TRANSFER LESS THAN 4 (MPI**2)								
U 9M+		760.	ID.		ARMENISE	65	HBC	+		
J 9M+		765.0	5.0		ALFF-STEI	66	HBC	+ 2-3 PI+ P		6/66
J 9M+	•	783.0	6.0		JAMES	66	HBC	+ 2.1 PI+ P		6/66
U 9M+		758.0	10.0		JAMES	66	HBC	SEE NOTE J BELOW		8/66
U 9M+	J	FROM JAMES WE USE MASS CALC FOR MOMENTUM TRANSFER LESS THAN 2.5 MPI**2								
U 9M+		750.0	3.0		BALTAY	66	HBC	+- 0.0 PBARP		6/66
U 9M-		748.0			KENNEY	62	HBC	-		
U 9M-		765.0	10.0		ERWIN	63	HBC	-		
J 9M-		130 775.0			GUIRAGOSS	63	HBC	-		
U 9M-		768.0	5.0		BLIEDEN	65	MMSP	- 3-5 PI- P		6/66
U 9M-		760.0	5.0		HAGOPIAN	66	HBC	- 3.0 PI- P		6/66
U 9M0		300 750.0	10.0		ALFF	62	HBC	0		
U 9M0		190 750.0	20.0		SAMIOS	62	HBC	0		
U 9M0		300 760.0	10.0		ABOLINS	63	HBC	0		
U 9M0		765.0	10.0		ERWIN	63	HBC	0		
U 9M0		160 775.0			GUIRAGOSS	63	HBC	0		
U 9M0		500 770.0	10.0		GOLDHABER	64	HBC	0		
U 9M0	•	735.0	10.0		ALYEA	65	DBC	0 2.2 K- P		6/66
U 9M0		750.0			CLARK	65	SPRK	0		
U 9M0		763.0			DERADO	65	OBC	0 4.0 PI- P		6/66
U 9M0		750.0	15.0		GUTAY	65	HBC	0 2.0 PI- P		6/66
U 9M0		740.0	10.0		LANZEROTT	65	CNTR	0		
U 9M0		768.0	14.0		ACCENSI	66	HBC	0 5.7 PBARP		6/66
U 9M0		790.0	5.0		ALFF-STEI	66	HBC	0 2-3 PI+ P		6/66
U 9M0		749.4	3.3		BALTAY	66	HBC	0 0.0 PBARP		6/66
U 9M0		775.0	5.0		HAGOPIAN	66	HBC	0 3.0 PI- P		6/66
U 9M0		765.0	8.0		JAMES	66	HBC	0 2.1 PI+ P		6/66
U 9M		290 755.0			CHADWICK	63	HBC	+-0		
J 9M		740.0			WALKER	62	HBC	-0		
U 9M		240 752.0			ALITTI	63	HBC	-0		
U 9M		765.0			LEE	65	HBC	-0		

9 RHO WIDTH (MEV)

J 9W+		610 130.0	10.0		ALFF	62	HBC	+		
U 9W+	C	77.0	20.0		CARMONY	64	HBC	+		
U 9W+	C	CARMONY WIDTH CALCULATED FOR MOMENTUM TRANSFER LESS THAN 4 (MPI**2)								
U 9W+		90.0	10.0		SACLAY	63	HBC	+		
J 9W+		160.	10.		ARMENISE	65	HBC	+		
U 9W+		100			ALFF-STEI	66	HBC	+ 2-3 PI+ P		6/66
U 9W+	•	177.0	15.0		JAMES	66	HBC	+ 2.1 PI+ P		7/66
U 9W+		147.0	19.0		JAMES	66	HBC	SEE NOTE J BELOW		8/66
U 9W+	J	FROM JAMES WE USE WIDTH CALC FOR MOMENTUM TRANSFER LESS THAN 2.5 MPI**2								
U 9W+		150.0	30.0		BALTAY	66	HBC	+- 0.0 PBARP		6/66
U 9W-	•	65.0	20.0		ERWIN	63	HBC	-		
U 9W-		130 125.0			GUIRAGOSS	63	HBC	-		
U 9W-		98 180.0			BONDAR	64	HBC	-		
U 9W-		127.0	5.0		BLIEDEN	65	MMSP	- 3-5 PI- P		6/66
U 9W-		150.0	20.0		HAGOPIAN	66	HBC	- 3.0 PI- P		6/66
U 9W0		300 100.0	10.0		ALFF	62	HBC	0		
J 9W0		190 150.0	20.0		SAMIOS	62	HBC	0		
U 9W0		300 90.0	10.0		ABOLINS	63	HBC	0		
U 9W0		165.0	20.0		ERWIN	63	HBC	0		
U 9W0		160 175.0			GUIRAGOSS	63	HBC	0		
J 9W0		96 210.0			BONDAR	64	HBC	0		
U 9W0		500 130.0			GOLDHABER	64	HBC	0		
U 9W0		110.0	20.0		ALYEA	65	DBC	0 2.2 K- P		6/66
U 9W0		130.0			CLARK	65	SPRK	0		
J 9W0		150.0			DERADO	65	HBC	0 4.0 PI- P		6/66
U 9W0		80.0	15.0		GUTAY	65	HBC	0 2.0 PI- P		6/66
U 9W0		150.0	10.0		LANZEROTT	65	CNTR	0		
U 9W0		72.0	30.0		ACCENSI	66	HBC	0 5.7 PBARP		6/66
J 9W0		100			ALFF-STEI	66	HBC	0 2-3 PI+ P		6/66
U 9W0		146.0	17.0		BALTAY	66	HBC	0 0.0 PBARP		6/66
U 9W0		120.0	10.0		HAGOPIAN	66	HBC	0 3.0 PI- P		6/66
J 9W0		103.0	13.0		JAMES	66	HBC	0 2.1 PI+ P		6/66
U 9W		290 110.0			CHADWICK	63	HBC	+-0		
U 9W		120.0			WALKER	62	HBC	-0		
J 9W		125.0	15.		LEE	65	HBC	-0		
U 9W	•	170.0			WOLF	65	RVUE			6/66

CODE . EVENTS QUANTITY ERROR+ ERROR- REFERENCE YR JECN SIGN COMMENTS DATE
ABOVE BACKGROUND PUNCHED

'N ANY SYMBOL IN COLUMN 8 INDICATES DATA IGNORED BY AVERAGING PROGRAMS

'9 RHO PARTIAL DECAY MODES

U 9P1 RHO INTO 2PI $ 85 8
U 9P2 RHO INTO 4PI $ 85 85 85 8
U 9P3 RHO INTO PI GAMMA $ 85 0
U 9P4 RHO INTO E+ E- $ 35 3
J 9P5 RHO INTO PI ETA $ 8514
U 9P6 RHO INTO MU+ MU- $ 45 4

9 RHO BRANCHING RATIOS

U 9R1 * RHO INTO 4PI/2PI (P2)/(P1)
U 9R1 * 0.05 OR LESS XUONG 62 HBC 6/66
U 9R1 * 0.026 OR LESS BLIEDEN 65 MMSP - 3-5 PI- P 6/66
U 9R1 * 0.01 OR LESS DEUTSCHMA 66 HBC + 8.0 PI+ P 6/66
U 9R1 * 0.006 OR LESS JAMES 66 HBC + 6/66

U 9R2 * RHO INTO PI GAMMA/2PI (P3/P1)
U 9R2 * 0.02 OR LESS DAUDIN 64 HBC + 6/66
U 9R2 * 0.007 OR LESS HUSON 66 HLBC

U 9R3 * RHO INTO(E+ E-)/(PI+PI-) (UNITS 1C**-4) (P4)/(P1)
U 9R3 0.5 0.6 0.3 ZDANIS 65 SPRK C 8/66

J 9R4 * RHO INTO (PI ETA)/(2PI) (P5)/(P1)
J 9R4 * 0.03 OR LESS DEUTSCHMA 66 HBC + 8.0 PI+ P 6/66

U 9R5 * RHO INTO (MU+ MU-)/(PI+ PI-) (UN 1C**-4) (P6)/(P1)
J 9R5 0.33 0.16 0.07 DE PAGTER 66 CNTR 0 5.2 GAM P 6/66

$K\bar{K}_1$ (1003)

16 K KBAR)1 (1025,JPG=) I=1

16 K KBAR)1 MASS (MEV)

U16M * 1060.0 BELYAKOV 64 PBC 6/66
U16M * 50 1025.0 APPROX. ARMENTERO 65 HBC +- 8/66
J16M 143 1003.3 7.0+SYSTEMATIC ROSENFELD 65 RVUE +- 8/66
J16M * SCAT. LENGTH 2 TO 6 FERMIS,BALTAY 66 HBC 8/66

16 K KBAR)1 WIDTH (MEV)

U16W * 60.0 BELYAKOV 64 PBC 6/66
J16W * 50 40.0 APPROX. ARMENTERO 65 HBC +-
J16W 143 57.0 13.0+SYSTEMATIC ROSENFELD 65 RVUE +- 8/66

U16 KKBAR)1 BRANCHING RATIOS

SEE NOTES ON MESONS FOLLOWING THESE LISTINGS

REFERENCES ON MESON RESONANCES

ALTHOR YR JOURNAL VOL. PAGE ALTHORS // LABORATORIES CODE

f (1254)

5 F (1250,JPG=2+)I=0

SELOVE 62 PRL 9 272 SELOVE,+AGOPIAN,BROOY,BAKER,LEROY // PENNA U 5
BONDAR 63 PL 5 153 BONDAR+//AACHEN+BIRM+BONN+DESY+IC-LOND+MPI U 5
VEILLET 63 PRL 10 29 VEILLET,+KENNESSY,BINGHAM,BLOCH+//PAR+PILAN U 5
LEE 64 PRL 12 342 LEE,ROE,SINCLAIR,VANDERVELDE //// MICHIGAN U 5

CHUNG 65 PRL 15 325 CHUNG,DAHL,HARDY,HESS,JACOBS,KIRZ //// LRL U 5
GUIRAGOS 65 PRL 11 65 Z G T GUIRAGOSSIAN ////////////////// LRL U 5
WANGLER 65 PR 137 B 414 T P WANGLER,R R ERWIN,W WALKER //WISCONSIN U 5
ACCENSI 66 PL 20 557 ACCENSI,ALLES-BORELLI,FRENCH,FRISK+ //CERN U 5
DELTSCHM 66 PL 20 82 DELTSCHMAN,STEINBERG + ///AACH+BERLIN+CERN L 5
WAHLIG 66 PR 147 941 +SHIBATA,GORDON,FRISCH,PANNELLI ///MIT+PISA J U 5

CLANTLY NUMBERS NOT REFERRED TO IN DATA CARDS

AGOPIAN 63 PRL 10 533 V AGOPIAN,W SELOVE ////////////////// PENNA U 5
ACERMOLZ 64 PL 10 240 AACHEN+BERLIN+BIRM+BONN+AMSTERDAM+IC-LOND+MPI IJ U 5
BRUYANT 64 PL 10 232 BRUYANT,GELFAND,HOLDER,FLEURY,HUC/CERN+PA I U 5
SOCIOKSC 64 PRL 12 485 SOCIOKSON,WAHLIG,PANNELLI,FRISCH+ //// MIT I U 5

D (1286)

8 C MESON(1285,JPG= 1)I=0

D'ANCLAU 65 PL 17 347 D ANCLAU,ASTIER,BARLOW +//CCF+CERN+RAD+LIV U 8
MILLER 65 PRL 14 1074 MILLER,CHUNG,DAHL,HESS,HARDY,KIRZ+//LRL+UC U 8

E (1418)

6 E MESON(1410,JPG=)I=0,1

ARMENTER 64 CUBNA CONF 1 467 ARMENTEROS,EDWARDS,JACOBSEN,ASTIER+ //CERN U 6
MILLER 65 PRL 14 1074 MILLER,CHUNG,DAHL,HESS,HARDY,KIRZ+ /LRL+UC L 6
ROSENFEL 65 OXFORD CONF 58 A H ROSENFELD ////////////////// LRL--RVUE U 6

---

f' (1500)

13 F PRIME (1500,JPC=2++) I=0

BARNES 65 PRL 15 322 BARNES,CULWICK,GUIDONI,GOZ,+CRWITZ+/BNL,SY U13
GLASHOW 65 PRL 15 329 S L GLASHOW, B W SCOLOW //SU3 BERKELEY U13
CREMALL 66 PRL 16 1025 + MALEFLEISCH,LAI,SCARR,SCHUMANN + // BNL I U13
GOLDBERG 66 SUBMITTED TO NC + LEITNER,PLSIC,C RAFFERTAIGH //SYRACUSE U13

ρ (756)

9 RHO(750,JPG=1-+)I=1

ANDERSON 61 PRL 6 365 ANDERSON,BANG,BURKE,CARMONY,SCHMITZ // LRL U 9
ALFF 62 PRL 9 322 ALFF,BERLEY,COLLEY,COLFAX,BRUEGER+/CCL+RU L 9
KENNEY 62 PR 126 736 V P KENNEY,W C SHEPPARD,C C GALL /KENTUCKY U 9
SAMIOS 62 PRL 9 139 SAMIOS,BACHMAN,LEA+ // BNL+CCNY+COLUM+KENT U 9
WALKER 62 CERN CONF 42 W C WALKER,E WEST A R ERWIN + // WISCONSIN U 9
XUONG 62 PR 128 1849 NGUYEN HUU XUONG,GERALD R LYNCH ////// LRL U 9

ABOLINS 63 PRL 11 381 ABOLINS,LANDER,PEHLKOP,NGUYEN,YAGER / UCSC U 9
ALITTI 63 NC 29 515 ALITTI,BATCH,ARMENISE+/SAC+CRSAY+BARI+PCLC U 9
CHADWICK 63 PRL 10 62 CHADWICK,DAVIES,DERRICK,CRESTI + / OXF+PAC U 9
GUIRAGOS 63 PRL 11 65 ZAVEN GUIRAGOSSIAN ////////////////// LRL U 9
ERWIN 63 SIENA CONF 1 112 ERWIN,SATTERLEE,WALKER,WEST /// WISCONSIN U 9
SACLAY 63 SIENA CONF 1 239 SACLAY+CRSAY+BARI + BCLCGNA(CCLLABCRATION) U 9

BATON 64 NC 35 713 BATON,BERTHELOT,ALLES,BORELLI + /CERN+BCLCC U 9
BONDAR 64 NC 31 729 BONDAR+//AACHEN+BIRM+BONN+DESY+IMP-CCL+MPI U 9
CARMONY 64 CUBNA CONF 1 486 CARMONY,HCA,LANDER,NG P XUONG,YAGER //UCSC U 9
CAUDIN 64 REPORT CEA-R-2525 CALCIA,JABICL,PONGELLI + ///// SACLAY+BARI U 9
GOLDHABER 64 PRL 12 336 GOLDHABER,ERONA,MACYK,SHEP,TRILLING/LRL+UC U 9

ALYEA 65 PL 15 82 ALYEA,CRITTENDEN,PARTIN,PHOCE + // INDIANA U 9
ARMENISE 65 NC 37 361 SACLAY+CRSAY+BARI+PCLCGNA (CCLLABCRATION) U 9
BLIEDEN 65 PL 15 444 BLIEDEN,FREYTAG,GEIBEL,MASSAM + ///// CERN U 9
CLARK 65 PR 139 B 1556 A CLARK,CHRISTENSEN,CRONIN,TURLAY/PRINCETC U 9
DERADO 65 PRL 14 872 DERADO,KENNEY,FOIRIER,SHEPHARD//NOTRE DAME U 9
GLTAY 65 NC 35 381 GLTAY,LANALTTI,TLLI /////////////// FLORIDA L 9
LANZEROTT 65 PRL 15 210 LANZEROTTI,BLUMENTHAL,EHN,FAISSLER +/+APVC U 9
LEE 65 MICH C4538 YONG-YLAG LEE ////////////////////// MICHIGAN U 9
WOLF 65 PL 19 328 G WOLF ////////////////////////////// DESY U 9
ZDANIS 65 PRL 14 721 ZDANIS,PACANSKY,KRAEMER + //////// JHU+BNL U 9

ACCENSI 66 PL 20 557 ACCENSI,ALLES-BORELLI,FRENCH,FRISK+// CERN U 9
ALFF-STE 66 PR 145 1072 ALFF-STEINBERGER,BERLEY,BRUGGER+//CCL+RUTG L 9
BALTAY 66 NEVIS 142 BALTAY,FRANZINI,LUTJENS,ZANELLO+//CCLUMBIA U 9
DE PAGTE 66 PRL 16 35 DE PAGTER+//CAR EL ACC+MIT+NORTHEAST+ SLAC L 9
DELTSCHM 66 PL 20 82 DEUTSCHMANN,STEINBERG +///AACH+BERLIN+ CERN U 9
HAGOPIAN 66 PR 145 1128 HAGOPIAN,SELOVE,ALITTI,BATON+//PENN+SACLAY U 9
HUSON 66 PL 20 91 HUSON,ALLARD,CRIJARD,KENNESSY + //CRSAY+EP U 9
JAMES 66 PR 142 896 F E JAMES,KRAYBILL /////// YALE+BROOKHAVEN U 9

EVIDENCE FOR STRUCTURE WITHIN THE RHO PEAK IS OBSERVED BY

KEEFE 64 CUBNA CONF 1 461 KEEFE,KERTH,NOBLE,THRESHER,WENZEL,ZIPF/LRL U 9
JONES 64 CUBNA CONF 1 457 L P JONES+ //// MICH+CERN+PRIN+PURDUE+DESY U 9

SEE ALSO

BUTTON 62 PR 126 1858 BUTTON,KALBFLEISCH,LYNCH,MAGLIC +// LRL+UC U 9
CALDWELL 62 PL 2 253 CALDWELL,FLEULER,GLSNER,JONES,ZACHAROV/CER U 9
FOELSCHE 62 CERN CONF 36 FOELSCHE,FOWLER,KRAYBILL,SANFORD+//YALE+BNL L 9

CLANTLY NUMBERS NOT REFERRED TO IN DATA CARDS

ERWIN 61 PRL 6 628 A R ERWIN,R MARCH,W WALKER,E WEST//BNL+WIS IJ U 9
PICKUP 61 PRL 7 192 E PICKUP,C ROBINSON,E SALANT /////////// BNL J U 9
STONEHIL 61 PRL 6 624 STONEHILL,BALTAY,COURANT,FOWLER+//YALE+BNL IJ U 9

$K\bar{K}_1$ (1003)

16 K KBAR)1 (1025,JPG=) I=1

BELYAKOV 64 JINR P-1588 BELYAKOV,VIRYASOV,KLACNITSKAYA + /// CUBNA U16
ARMENTER 65 PL 17 344 ARMENTEROS,EDWARDS,JACOBSEN +///CERN+PARIS U16
ASTIER 65 OXFORD ABS.143 AND SUPPL. P 12 CERN+CCLL CE FR. U16
BARASH 65 PR 139 B 1655 +FRANZINI,KIRSCH,FILLER,STEINBERGER+/CCLUM U16
ROSENFEL 65 OXFORD CONF 58 A H ROSENFELD ////////////////// LRL--RVUE U16
BALTAY 66 PR 142 B 932 +LACH,SANDWEISS,TAFT,YEH,STONEHILL+ //YALE U16

DATA ON MESON RESONANCES

CODE EVENTS QUANTITY ERROR+ ERROR- REFERENCE YR TECN SIGN COMMENTS DATE
ABOVE BACKGROUND PUNCHED

N ANY SYMBOL IN COLUMN 8 INDICATES DATA IGNORED BY AVERAGING PROGRAMS

A_1 (1080)

10 A1 MESON ([redacted]/1080, JPG= -) I=1

10 A1 MESON MASS (MEV)

U10M		1080.0	20.0		ALLARD	64	FBC	-	
U10M		1080.0	10.0		HESS	64	HBC	-	
U10M		1080.0			ADERHOLZ	64	HBC		
J10M		1080.0			DEUTSCHMA	66	HBC	+ 8.0 PI+ P	6/66

10 A1 MESON WIDTH (MEV)

U10W	*	100.0	APPROX		HESS	64	HBC	-	
U10W	*	150.0	APPROX		ALLARD	64	FBC	-	
J10W		80.0			ADERHOLZ	64	HBC		

10 A1 PARTIAL DECAY MODES

U10P1	A1 INTO RHO PI		U 9S 8
U10P2	A1 INTO KBAR K		S10S11
U10P3	A1 INTO ETA PI		S14S 8
U10P4	A1 INTO ETA PRIME PI		U 2S 8

10 A1 BRANCHING RATIOS

U10R1	*	A1 INTO (KBAR K)/(RHO PI)						(P2)/(P1)	
U10R1	*	0.05 OR LESS			CHUNG	64	HBC		
U10R1	*	0.01 OR LESS			DEUTSCHMA	66	HBC	+	6/66
J10R2	*	A1 INTO (ETA PI)/(RHO PI)						(P3)/(P1)	
U10R2	*	0.015 OR LESS			DEUTSCHMA	66	HBC	+	6/66
U10R3	*	A1 INTO (ETA PRIME PI)/(RHO PI)						(P4)/(P1)	
J10R3	*	0.015 OR LESS			DEUTSCHMA	66	HBC	+	6/66

U10R *FOR 1+ NONET SU3 RATES SEE E.G. SHEN+, UCRL 16936(66) SUBM. TO PRL

B (1220)

11 B MESON (1220,JPG= +) I=1

U11 * FOR EVIDENCE THAT THE B IS JUST DECK EFFECT, SEE CHUNG 66

11 B MESON MASS (MEV)

U11M		60	1220.0		ABOLINS	63	HBC	+	
U11M			1220.0		HESS	64	HBC	-	
J11M			1220.0		GOLDHABER	65	HBC		

11 B MESON WIDTH (MEV)

U11W		60	100.0	20.0	ABOLINS	63	HBC	+	
U11W			180.0	30.0	HESS	64	HBC	-	
J11W			80.0		GOLDHABER	65	HBC		

11 B MESON PARTIAL DECAY MODES

U11P1	B MESON INTO OMEGA+PI	U 1S 8
U11P2	B MESON INTO 2PI+ 2PI-	S 8S 8S 8S 8
U11P3	B MESON INTO K KBAR	S10S10
U11P4	B MESON INTO PI PI	S 8S 8

11 B MESON BRANCHING RATIOS

J11R1	*	B INTO 4PI/(OMEGA PI)						(P2)/(P1)	
U11R1	*	0.5 OR LESS			ABOLINS	63	HBC	+	
J11R2	*	B MESON INTO (K KBAR)/(OMEGA PI)						(P3)/(P1)	
U11R2	*	0.10 OR LESS			HESS	64	HBC		
U11R3	*	B MESON INTO (PI PI)/(PI OMEGA)						(P4)/(P1)	
J11R3	*	0.3 OR LESS			ADERHOLZ	64	HBC		7/66

A_2 (1310)

12 A2 MESON (1310,JPG=2+-) I=1

12 A2 MESON MASS (MEV)

U12M			1320.0		ADERHOLZ	64	HBC		
U12M		70	1310.0		CHUNG	64	HBC	-	
U12M			1335.0	10.0	GOLDHABER	64	HBC	+- 3.7 PI+- P	
J12M			1285.0		ARMENTERO	65	HBC	K1K1 DECAY	6/66
U12M			1270.0		DERADO	65	HBC		6/66
U12M		1425	1290.0	5.0	LEFEBVRES	65	MMSP	-	6/66
U12M			1300.0		SEIDLITZ	65	DBC	-	6/66
J12M			1290.0	10.0	BARNES	66	HBC	-	6/66
U12M			1280.0		DEUTSCHMA	66	HBC	+ 8.0 PI+ P	6/66
U12M			1310.0	10.0	BENSON	66	DBC		6/66

12 A2 MESON WIDTH (MEV)

U12W			100.0		ADERHOLZ	64	HBC		
U12W		70	80.0		CHUNG	64	HBC	-	
U12W			90.0	10.0	GOLDHABER	64	HBC	+- 3.7 PI+- P	
U12W			150.0		DERADO	65	HBC		6/66
U12W		1425	99.0	15.0	LEFEBVRES	65	MMSP	-	6/66
U12W			140.0		SEIDLITZ	65	DBC	-	6/66
U12W			70.0	10.0	BARNES	66	HBC	-	6/66
U12W			110.0	45.0	BENSON	66	DBC		6/66

12 A2 MESON PARTIAL DECAY MODES

U12P1	A2 MESON INTO RHO PI	U 9S 8
U12P2	A2 MESON INTO KBAR K	S10S12
U12P3	A2 MESON INTO ETA PI	S14S 8
U12P4	A2 MESON INTO ETA PRIME PI	U 2S 8
U12P5	A2 MESON INTO PI+ PI- PIO	S 8S 8S 9

12 A2 MESON BRANCHING RATIOS

J12R1	*	A2 MESON INTO (K KBAR) / (RHO PI)						(P2)/(P1)	
U12R1	*	0.04 OR LESS			ARMENTERO	65	HBC	-	
U12R1		0.03	0.02		DEUTSCHMA	66	HBC	+	6/66
U12R2	*	A2 MESON INTO (ETA PI)/TOTAL						(P3)/TOTAL	
U12R2		0.03	0.03		CHUNG	65	HBC	-	
U12R2	*	0.03 OR LESS			DEUTSCHMA	66	HBC	+	6/66
U12R7	*	A2 MESON INTO (ETA PI) / (RHO PI)						(P3)/(P1)	
U12R7		0.3	0.2		ADERHOLZ	65	HBC		
U12R3	*	A2 MESON INTO (RHO PI)/TOTAL						(P1)/TOTAL	
U12R3		0.91	0.04	0.10	CHUNG	65	HBC	-	
U12R4	*	A2 MESON INTO (ETA PRIME PI) / TOTAL						(P4)/TOTAL	
U12R4	*	0.1 OR LESS			CHUNG	65	HBC	-	
U12R4	*	0.015 OR LESS			DEUTSCHMA	66	HBC	+	6/66
U12R5	*	A2 MESON INTO (KBAR K)/TOTAL						(P2)/TOTAL	
U12R5		0.055	0.015		CHUNG	65	HBC	-	
U12R6	*	A2 MESON INTO (PI+ PI- PIO) / (RHO PI)						(P5)/(P1)	
U12R6	*	0.17 OR LESS			BENSON	66	DBC	0	

U12R *FOR 2+ NONET SU3 RATES SEE E.G. GLASHOW, SOCOLOW, PRL 15,329(65)

$\pi\pi\pi$ (1630)

34 3 PI (1630,JPG=) I=1

EVIDENCE NOT YET COMPELLING, OMITTED FROM TABLE

34 3 PI (1630) MASS (MEV)

U34M		20	1630.0	30.0	VETLITSKY	66	HBC	- 4.7 K- P	6/66

34 3 PI (1630) WIDTH (MEV)

U34W		20	100.		VETLITSKY	66	HBC	-	6/66

$\pi\pi$ (1670)

15 PI PI (1670, JPG=) I =

EVIDENCE NOT YET COMPELLING, OMITTED FROM TABLE

U15 * FOR COMPILATIONS AND NEGATIVE EVIDENCE, SEE ROSENFELD 65, OXFORD RVUE 8/66

15 PI PI (1670) MASS (MEV)

U15M			1700.0	100.0	BELLINI	65	HLBC	0	6/66
U15M			1620.0	20.0	DEUTSCHMA	65	HBC	+	6/66
U15M			1670.0		FORINO	65	DBC	0	6/66
J15M			1670.0	30.0	GOLDBERG	65	HBC	0	
U15M			1675.0	15.0	SEGUINOT	66	MMS	-	6/66

15 PI PI (1670) WIDTH (MEV)

J15W		13	80.0	40.0	DEUTSCHMA	65	HBC	+	6/66
U15W			40.0		FORINO	65	DBC	0	6/66
U15W			180.0	40.0	GOLDBERG	65	HBC	0	
U15W			66.0	10.0	SEGUINOT	66	MMS	-	6/66

CODE	EVENTS ABOVE BACKGROUND	QUANTITY	ERROR+	ERROR-	REFERENCE	YR	TECN	SIGN	COMMENTS	DATE PUNCHED

N ANY SYMBOL IN COLUMN 8 INDICATES DATA IGNORED BY AVERAGING PROGRAMS

S (1930)

31 S(1930, JP= , I GTE 1) 3 CHARGED DECAY TRACKS

EVIDENCE NOT YET COMPELLING,OMITTED FROM TABLE

31 S (1930) MASS (MEV)

U31M		1929.0	14.0		CHIKOVANI	66	MMSP	-	8/66
U31M	15	1910.0	20.0		DEUTSCHMA	65	HBC	+	6/66

31 S (1930) WIDTH (MEV)

U31W		35.0	OR LESS		CHIKOVANI	66	MMSP	-	8/66
U31W	15	90.0	40.0		DEUTSCHMA	65	HBC	+	6/66

T (2200)

32 T(2200, JP= , I GTE 1) 3 CHARGED DECAY TRACKS

EVIDENCE NOT YET COMPELLING,OMITTED FROM TABLE

32 T(2200) MASS (MEV)

U32M		2195.0	15.0		CHIKOVANI	66	MMSP	-	8/66

32 T(2200) WIDTH (MEV)

U32W	*	13.0	OR LESS		CHIKOVANI	66	MMSP	-	8/66

U (2390)

33 U(2390, JP= , I GTE 1) 1,3,5, CHARGED TRACKS

EVIDENCE NOT YET COMPELLING,OMITTED FROM TABLE

33 U(2390) MASS (MEV)

U33M		2382.0	24.0		CHIKOVANI	66	MMSP	-	8/66

33 U(2390) WIDTH (MEV)

U33W	*	30.0	OR LESS		CHIKOVANI	66	MMSP	-	8/66

REFERENCES ON MESON RESONANCES

AUTHOR	YR	JOURNAL	VOL.	PAGE	AUTHORS // LABORATORIES	CODE

A_1 (1080)

1C A1 MESON(1080,JPG= -+) I=1

BELLINI	63	NC	29	856	BELLINI,FIORINI,NEPZ,NEGRI,RATTI /// MILAN	U10
ADERHOLZ	64	PL	10	226	AACH+BERL+BIRM+BONN+DESY+KARL+IMP,COL+ MPI	U10
ALLARD	64	PL	12	143	ALLARD+ // PARIS+CERN+MILAN+CEA-SAC+UC-BKY	U10
CHUNG	64	PRL	12	621	CHUNG,DAHL,HARDY,HESS,KALBFLEISCH + // LRL	U1C
GOLDHABE	64	PRL	12	336	GOLDHABER,BROWN,KADYK,SHEN,TRILLING/LRL+UC	U10
HESS	64	DUBNA CONF	1	422	HESS,CHUNG,DAHL,HARDY,KIRZ,MILLER //// LRL	U1C
LANDER	64	PRL	12	346 A	LANDER,ABOLINS,CARMONY,HENDRICKS +/// UCSC	JP U10
ALITTI	65	PL	15	65	ALITTI,BATEN,DELER,CRUSSARD+//CERN+SAC+BCL	U1C
DEUTSCHM	66	PL	20	82	DEUTSCHMANN,STEINBERG + //AACH+BERLIN+CERN	U10

B (1220)

11 B MESON(1220,JPG= +)I=1

ABOLINS	62	PRL	11	381	ABOLINS,LANDER,PEHLMOP,XUONG,YAGER // UCSC	U11
BONDAR	63	PL	5	209	BONDAR,DODD+//AACHEN+BIRM+HAMB+IC-LOND+MPI	U11
CHUNG	63	SIENA CONF	1	201	CHUNG,DAHL,HESS,KALBFLEISCH,KIRZ + /// LRL	U11
ADERHOLZ	64	PL	10	240	AACHEN+BERLIN+BIRM+BONN+HAMBUR+IC-LOND+MPI	U11
HESS	64	DUBNA CONF	1	422	HESS,CHUNG,DAHL,HARDY,KIRZ,MILLER //// LRL	U11
GOLDHABE	65	PRL	15	118	G GOLDHABER,S GOLDHABER,MACYK,SHEN /// LRL	U11

QUANTUM NUMBER DETERMINATIONS NOT REFERRED TO IN THE DATA CARDS

CARMONY	64	PRL	12	254	CARMONY,LANDER,RINDFLEISCH,XUONG,YAGER//UC	JP U11

A_2 (1310)

12 A2 MESON(1310,JPG=2+-)I=1

ADERHOLZ	64	PL	10	248	AACHEN+BERLIN+BIRM+BONN+HAMB+IC-LONDON+MPI	U12
CHUNG	64	PRL	12	621	CHUNG,DAHL,HARDY,HESS,KALBFLEISCH+ /// LRL	U12
GOLDHABE	64	DUBNA CONF	1	420	G GOLDHABER,S GOLDHABER,CHALLCRAN,SHEN/LRL	U12
HESS	64	DUBNA CONF	1	422	HESS,CHUNG,DAHL,HARDY,KIRZ,MILLER //// LRL	U12
CHUNG	65	PRL	15	481	S CHUNG,REVEU-RENE,DAHL,KIRZ,MILLER+ //LRL	U12
ARMENTER	65	PL	17	344	ARMENTEROS,EDWARDS,JACOBSEN + //CERN+CDEF	U12
CHUNG	65	PRL	15	325	CHUNG,DAHL,HARDY,JACOBS,KIRZ,MILLER+ //LRL	U12
GERALDO	65	PRL	14	672	GERALDO,KENNEY,POIRIER,SHEPHARD//NOTRE DAME	U12
LEFEBVRE	65	PL	15	434	LEFEBVRES,LEVRAT,LLIEDEN,DUBAL + //CERN	U12
SEIDLITZ	65	PRL	15	217	L SEIDLITZ,D E DAHL,D H MILLER /////// LRL	U12
BARNES	66	PRL	16	41	BARNES,FOWLER,LAI,GRENSTEIN + /// BNL+CCNY	U12
BENSON	66	PRL	16	1177	G BENSON,LOVELL,MARQUIT,MCES + // MICHIGAN	U12
DEUTSCHM	66	PL	20	82	DEUTSCHMANN,STEINBERG + //AACH+BERLIN+CERN	U12

QUANTUM NUMBER DETERMINATIONS NOT REFERRED TO IN THE DATA CARDS

LANDER	64	PRL	13	346 A	LANDER,ABOLINS,CARMONY,HENDRICKS +/// UCSD	JP U12
ADERHOLZ	65	PR	139	B 857	AACHEN+BERLIN+BIRM+BONN+IMPE+LOND+MUENCHEN	U12

FOR QUANTUM NUMBERS OF NEUTRAL A2, SEE BENSON ABOVE

$\pi\pi\pi$ (1630)

34 3 PI (1630,JPG=) I=1

VETLITSK	66	PL	21	575	VETLITSKY,GUSZAVIN,KLIGER,ZOLGANOV+ //ITEP	S34

$\pi\pi$ (1670)

15 PI PI (1670, JPG= I I =

BELLINI	65	NC	40	948	BELLINI,DI CEPATC,CUIMINC,FIORINI //MILANO	U15
CELTSCHM	65	PL	18	351	DEUTSCHMANN,SCHULTE + //// AACH+ZEUT+CERN	U15
FORINO	65	PL	19	69	FORINO,GESSARCLI + //BOLOGNA+CRSAY+SACLAY	U15
GOLDBERG	65	PL	17	354	GOLDBERG+/CERN+PARIS+CRSAY+MILANO+CEA-SACL	U15
SEGUINOT	66	PL	19	712	SEGUINOT,MARTIN,MAGLIC,LEVRAT,DUBAL+//CERN	U15

S (1930)

31 S(1930, JP= , I GTE 1) 3 CHARGED DECAY TRACKS

CHIKOVAN	66	PL	22	233	+DUBAL,FOCACCI,KIENZLE,LEVRAT,MAGLI+/CERN+	U31

T (2200)

32 T(2200, JP= , I GTE 1) 3 CHARGED DECAY TRACKS

CHIKOVAN	66	PL	22	233	+DUBAL,FOCACCI,KIENZLE,LEVRAT,MAGLI+/CERN+	U32

U (2390)

33 U(2390, JP= , I GTE 1) 1,3,5, CHARGED TRACKS

CHIKOVAN	66	PL	22	233	+DUBAL,FOCACCI,KIENZLE,LEVRAT,MAGLI+/CERN+	U33

DATA ON MESON RESONANCES.

CODE	EVENTS ABOVE BACKGROUND	QUANTITY	ERROR+	ERROR−	REFERENCE	YR	TECN	SIGN	COMMENTS	DATE PUNCHED

N ANY SYMBOL IN COLUMN 8 INDICATES DATA IGNORED BY AVERAGING PROGRAMS

κ (725)

17 KAPPA (725,J =) I=1/2

U17 *MANY LATER EXPERIMENTS FAIL TO CONFIRM. NOTE FOLLOWS THIS LISTING 8/66

17 KAPPA MASS (MEV)

U17M			730.0		ALEXANDER	62	HBC	+	0	
U17M		92	726.0	3.0	MILLER	63	HBC	+	0	
U17M		33	723.0	3.0	WOJCICKI	63	HBC	−		
J17M			725.0		CONNULLY	63	HBC			
U17M			725.0	5.0	FERRO-LUZ	64	HBC	+	0	
U17M			735.0	5.0	KIM	65	SPRK			6/66
U17M	*		730.0	APPROXIMATELY	LONDON	66	HBC			6/66

17 KAPPA WIDTH (MEV)

U17W	*	92	20.0	OR LESS	MILLER	63	HBC	+	0	
U17W	*	33	12.0	OR LESS	WOJCICKI	63	HBC	−		
U17W	*		30.0	OR LESS	FERRO-LUZ	64	HBC	+	0	
U17W	*		20.0	OR LESS	KIM	65	SPRK			6/66
U17W	*		15.0	OR LESS	LONDON	66	HBC			6/66

17 KAPPA PARTIAL DECAY MODES

U17P1	KAPPA INTO K PI	S10S 8

K*(892)

18 K* (890,JP =1−) I=1/2

18 K* (890) MASS (MEV)

U18M			898.0	5.0	CHADWICK	63	HBC	+		
U18M			891.0	3.0	FERRO-LUZ	65	HBC	+		
J18M			890.5		ARMENTERO	65	HBC	+−		
U18M		3870	891.0	1.0	WOJCICKI	63	HBC	−		
U18M			891.0	3.0	GELSEMA	64	HBC	−		
U18M		200	880.0		ALEXANDER	62	HBC	+	0	
U18M			895.0	2.0	FERROLUZZ	65	HBC	+	0	6/66
U18M			895.0		WANGLER	65	HBC	+	0	6/66
U18M			885.0		ARMENTERO	62	HBC	+−0		
U18M		70	897.0	10.0	COLLEY	62	HBC		0	
U18M		200	892.0	2.0	KRAEMER	63	HBC		0	
U18M		150	885.0		SMITH	63	HBC		C	

18 K* (890) WIDTH (MEV)

J18W			46.0	8.0	CHADWICK	63	HBC	+		
U18W			47.0	4.0	FERRO-LUZ	65	HBC	+		
U18W		3870	46.0	3.0	WOJCICKI	63	HBC	−		
J18W			50.0	13.0	GELSEMA	64	HBC	−		
U18W			31.0	&	ARMENTERO	65	HBC	+−		
J18W		200	60.0	5.0	ALEXANDER	62	HBC	+	0	
U18W			51.8	3.5	FERROLUZZ	65	HBC	+	0	6/66
U18W			40.0		WANGLER	65	HBC	+	0	6/66
U18W			55.0		ARMENTERO	62	HBC	+−0		
U18W		70	60.0	10.0	COLLEY	62	HBC		0	
J18W		200	50.0	5.0	KRAEMER	63	HBC		0	
U18W		150	50.0		SMITH	63	HBC		0	

18 K* (890) PARTIAL DECAY MODES

U18P1	K* INTO K PI	S10S 8
U18P2	K*(890) INTO (K PI PI)	S10S 8S 8
U18P3	K* INTO KAPPA PI	U17S 8

18 K* (890) BRANCHING RATIOS

U18R1	*	K* (890) INTO (KAPPA PI)/(K PI)						(P3)/(P1)
U18R1	*	3	0.005 OR LESS		GOLDHABER	63	HBC	−
U18R1	*	0	0.002 OR LESS		WOJCICKI+	63	HBC	−
U18R1	*		0.01 OR LESS		FERRO-LUZ	64	HBC	+ 0
J18R2	*	K*(890) INTO (K PI PI)/(K PI)						(P2)/(P1)
U18R2	*	0	0.002 OR LESS		WOJCICKI+	63	HBC	−

K_c (1215)

20 KC MESON (1215,JP=) I=1/2

20 KC MASS (MEV)

J20M	1215.0	15.0	ARMENTERO	64 HBC

20 KC WIDTH (MEV)

U20W	60.0	10.0	ARMENTERO	64 HBC

20 KC PARTIAL DECAY MODES

U20P1	KC INTO K RHO	S10U 9
U20P2	KC INTO K* PI	U18S 8
U20P3	KC INTO K PI PI	S11S 8S 8

20 KC BRANCHING RATIOS

J20R1	*	KC INTO (K RHO)/TOTAL		(UNITS OF 10**−2)				(P1)/TOTAL
U20R1		75.0	10.0	ARMENTERO	64	HBC		6/66
U20R2	*	KC INTO (K* PI)/TOTAL		(UNITS OF 10**−2)				(P2)/TOTAL
J20R2		25.0	10.0	ARMENTERO	64	HBC		6/66

Kππ (1320)

21 K2PI (1320,JPC=) I=1/2

J21 *THIS BUMP PARTLY DECK EFFECT BUT BISHOP+,SHEN+ SEE EVID. FOR RESONANCE

21 K2PI(1320) MASS (MEV)

J21M		12	1320.0		ALMEIDA	65	HBC	+	3-5 K+ P	8/66
U21M		50	1320.0		DE BAERE	65	HBC	+	3-5 K+ P	8/66
U21M		20	1305.0	10.0	BISHOP	66	HBC	+ C	2.6 K+ P	8/66
J21M		40	1310.0		BISHOP	66	HBC	K PI	MODE-SURPRISE	8/66
J21M		70	1320.0	10.0	SHEN	66	HBC	+	4.6 K+ P	8/66

21 K2PI(1320) WIDTH (MEV)

U21W		12	60.0		ALMEIDA	65	HBC	+		8/66
J21W		60	40.0	15.0	BISHOP	66	HBC	+		8/66
J21W		70	80.0	20.0	SHEN	66	HBC	+		8/66

21 K2PI(1320) PARTIAL DECAY MODES

J21P1	K2PI INTO K*(890) PI	U18S08
U21P2	K2PI INTO K RHO	S11U09
U21P3	K2PI INTO K OMEGA	S11U01
J21P4	K2PI INTO K PI	S10S 8
U21P5	K2PI INTO K ETA	S10S14

U21 K2PI(1320) BRANCHING RATIOS

J21R1	*	K2PI INTO K*(890) PI AND K RHO (OVERLAPPING BANDS)								
J21R1		70	1.0		SHEN	66	HBC	+		8/66
J21R2	*	K2PI INTO(K OMEGA)/(K*(890) PI)							(P3)/(P1)	
J21R2	*		0.15 OR LESS		SHEN	66	HBC			8/66
J21R3	*	K2PI(1320) INTO (K*(890) PI) / TOTAL							(P1)/TOTAL	
J21R3			0.24	0.09	BISHOP	66	HBC			6/66
J21R4	*	K2PI(1320) INTO (K PI) / TOTAL							(P4)/TOTAL	
J21R4			0.68	0.12	BISHOP	66	HBC			6/66
J21R5	*	K2PI(1320) INTO (K RHO) / TOTAL							(P2)/TOTAL	
J21R5			0.06	0.06	BISHOP	66	HBC			6/66
J21R6	*	K2PI(1320) INTO (K ETA) / TOTAL							(P5)/TOTAL	
J21R6			0	0.030	BISHOP	66	HBC			6/66
J21R7	*	K2PI(1320) INTO (K OMEGA) / TOTAL							(P5)/TOTAL	
J21R7			0.020	0.020	BISHOP	66	HBC			6/66

J21R *FOR I+ NONET SU3 RATES SEE E.G. SHEN+, UCRL 16536(66) SUBM. TO PRL

K*(1400)

22 K* (1400,JP=) I=1/2

22 K*(1400) MASS (MEV)

U22M			1400.0	20.0	BADIER	65	HBC			6/66
U22M			1404.0	15.0	FOCARDI	65	HBC			
U22M		21	1400.0	10.0	HAQUE	65	HBC			
U22M		26	1430.0	20.0	HARDY	65	HBC			
U22M		4C	1440.0		BARTSCH	66	HBC			8/66
U22M			1425.0	10.0	BISHOP	66	HBC			8/66
U22M			1430.0	20.0	SHEN	66	HBC		4.6 K+ P	8/66

22 K*(1400) WIDTH (MEV)

U22W			109.0	30.0	BADIER	65	HBC			8/66
U22W			92.0	14.0	FOCARDI	65	HBC			
U22W		21	160.0		HAQUE	65	HBC			
U22W		26	100.0	20.0	HARDY	65	HBC			
U22W			96.0	10.0	BISHOP	66	HBC			8/66
U22W			75.0	25.0	SHEN	66	HBC		4.6 K+ P	8/66

22 K* (1400) PARTIAL DECAY MODES

U22P1	K*(1400) INTO K PI	S10S 8
U22P2	K*(1400) INTO K*(890) PI	U18S 8
U22P3	K*(1400) INTO K RHO	S10U 9
U22P4	K*(1400) INTO K OMEGA	S10U 1
U22P5	K*(1400) INTO K ETA	S10S14

U22 K*(1400) BRANCHING RATIOS

U22R1	*	K*(1400) INTO (K PI)/TOTAL							(P1)/TOTAL	
U22R1			0.37	0.19	BADIER	65	HBC			8/66
U22R1			0.33	0.07	BISHOP	66	HBC			8/66
U22R2	*	K*(1400) INTO (K*(890) PI) / TOTAL							(P2)/TOTAL	
U22R2			0.41	0.14	BADIER	65	HBC			8/66
U22R2			0.56	0.10	BISHOP	66	HBC			8/66
U22R3	*	K*(1400) INTO (K RHO)/TOTAL							(P3)/TOTAL	
U22R3			0.14	0.05	BADIER	65	HBC			8/66
U22R3			0.10	0.05	BISHOP	66	HBC			8/66
U22R4	*	K*(1400) INTO (K OMEGA)/TOTAL							(P4)/TOTAL	
U22R4			0.07	0.04	BADIER	65	HBC			8/66
U22R4			0.007	0.008	BISHOP	66	HBC			8/66
U22R5	*	K*(1400) INTO (K ETA)/TOTAL							(P5)/TOTAL	
U22R5			0.02	0.02	BADIER	65	HBC			8/66
U22R5			0.017	0.02	BISHOP	66	HBC			8/66
U22R6	*	K*(1400) INTO (K*(890) PI) / (K PI)							(P2)/(P1)	
U22R6		8	0.33	0.33	CHUNG	65	HBC	+ 0	3.9-4.2 PI- P	8/66
U22R6			0.64	0.20	SHEN	66	HBC			8/66
U22R7	*	K*(1400) INTO (K OMEGA) / TOTAL							(P4)/(P1)	
U22R7			0.05	0.03	0.05	SHEN	66	HBC		8/66
U22R8	*	K*(1400) INTO (K RHO) / (K PI)							(P3)/(P1)	
U22R8	*		0.05	OR LESS	CHUNG	65	HBC	+ 0	3.9-4.2 PI- P	8/66

U22R *FOR 2+ NONET SU3 RATES SEE E.G. GLASHOW,SCCCLCW, PRL 15,329(65)

CODE EVENTS QUANTITY ABOVE BACKGROUND ERROR+ ERROR- REFERENCE YR TECH SIGN COMMENTS DATE PUNCHED

N ANY SYMBOL IN COLUMN 8 INDICATES DATA IGNORED BY AVERAGING PROGRAMS

$K\pi\pi$ (1800)

U23 K2PI (1800, JP=) I = 1/2
NAMED L BY BARTSCH ET AL.

U23 K2PI (1800) MASS (MEV)

J23M	80	1789.0	10.0		BARTSCH	66 HBC	- 10.0 K- P	8/66
J23M	35	1852.0	8.0		DUBAL	66 MMSP	- 12.0 K- P	8/66

U23 K2PI (1800) WIDTH (MEV)

J23W	80.0	20.0	40.0	BARTSCH	66 HBC		8/66
J23W	84.0	14.0		DUBAL	66 MMSP		8/66

U23 K2PI (1800) PARTIAL DECAY MODES

U23P1	K2PI INTO K PI	S11S 9
J23P2	K2PI INTO K RHO	S11U 9
J23P3	K2PI INTO K*(890) PI	S 9UL8
U23P4	K2PI INTO K OMEGA	S11U 1
U23P5	K2PI INTO K PI PI	S11S 9S 9

U23 K2PI (1800) BRANCHING RATIOS

U23R1	*	K2PI INTO (K PI)/TOTAL	BARTSCH+ SEE NONE(LESS THAN .05).		8/66
U23R2	*	K2PI INTO (K RHO)/TOTAL			
U23R3	*	K2PI INTO (K*(890) PI)/TOTAL			
J23R4	*	K2PI INTO (K OMEGA)/TOTAL	BARTSCH+ PROBABLY SEE THIS MODE		8/66
U23R5	*	K2PI INTO 1 CHARGED/(3 CH.+ 5 CH.)	DUBAL 66 GIVE ABOUT 0.4.		8/66

$K^*_{3/2}$ (1175)

24 K* 3/2 (1175, JP=) I = 3/2 ?

EVIDENCE NOT YET COMPELLING, OMITTED FROM TABLE

U24 +FOR COMPILATIONS + NEG. EVID. SEE ROSENFELD, OXFORD 65 SUPPL.
J24 +BISHOP 66 SEES SLIGHT EVIDENCE FOR I = 3/2

24 K* 3/2 (1175) MASS (MEV)

U24M	*	23	1175.0		WANGLER	64 HBC		
J24M	*	15	1160.0	10.0	MILLER	65 HBC	PURDUE	
U24M	*		1180.0		BISHOP	66 HBC	SUGGEST I=3/2	6/66

24 K* 3/2 (1175) WIDTH (MEV)

U24W	*	23	25.0	OR LESS	WANGLER	64 HBC		
U24W	*	15	35.0	10.0	MILLER	65 HBC	PURDUE	
U24W	*		50.0		BISHOP	66 HBC		6/66

$K^*_{3/2}$ (1270)

25 K* 3/2 (1270, JP =) I = 3/2

EVIDENCE NOT YET COMPELLING, OMITTED FROM TABLE

U25 +FOR COMPILATIONS + NEG. EVID. SEE ROSENFELD, OXFORD 65 SUPPL.

25 K* 3/2 (1270) MASS (MEV)

U25M	1270.0	20.0		BOCK	64 HBC

25 K* 3/2 (1270) WIDTH (MEV)

J25W	60.0	30.0	BOCK	64 HBC

25 K* 3/2 (1270) PARTIAL DECAY MODES

U25P1	K* 3/2 (1270) INTO K*(890) PI	U1BS 8
U25P2	K* 3/2 (1270) INTO K RHO	S10U 9

K^+K^+ (1055)

29 K+K+ (1055, JP=) I=1 S=2

EVIDENCE NOT YET COMPELLING, OMITTED FROM TABLE

29 K+K+ (1055) MASS (MEV)

U29M	1055.0	20.0	FERRO-LUZ	65 HBC

29 K+K+ (1055) WIDTH (MEV)

U29W	60.0	25.0	FERRO-LUZ	65 HBC

K^+K^+ (1280)

30 K+K+ (1280, JP=) I=1 S=2

EVIDENCE NOT YET COMPELLING, OMITTED FROM TABLE

30 K+K+ (1280) MASS (MEV)

U30M	1280.0	20.0	FERRO-LUZ	65 HBC
J30M	N NEG. RESULT, 2/3 DATA OF FERRO-L	ERWIN	66 HBC	SEE ROSENFELD 65

30 K+K+ (1280) WIDTH (MEV)

U30W	110.0	40.0	FERRO-LUZ	65 HBC

REFERENCES ON MESON RESONANCES

κ (725)

17 KAPPA(725, JP=) I=1/2

ALEXANDE	63	PRL 8 447	ALEXANDER,KALBFLEISCH,MILLER,SMITH//LRL+UC	U17
CONNOLLY	63	SIENA CONF 1 125	P L CONNOLLY E L HART + ///// BNL+SYRACUSE	U17
MILLER	63	PL 5 279	MILLER,ALEXANDER,CAHL,JACOBS,KALBFLEIS/LRL	U17
WOJCICKI	63	PL 5 283	S WOJCICKI,G KALBFLEISCH,M ALSTON //// LRL	U17
FERROLUZ	64	PL 12 255	FERRO-LUZZI,GEORGE,HENRI,JONGEJANS+ //CERN	U17
KIM	65	PL 19 350	KIM,BLOBLESCN,KALPUS,ROBERTS + /// OHIO+ANL	U17
LONDON	66	PR 143 1034	LONDON,RAU,SAMIOS,GOLDBERG +//BNL+SYRACUSE	U17

$K^*(892)$

18 K*(890, JP=1-, I=1/2

ALSTON	61	PRL 6 300	ALSTON,ALVAREZ,EBERHARD,GOOD,GRAZIANO+/LRL	U18
ALEXANDE	62	PRL 8 447	ALEXANDER,KALBFLEISCH,MILLER,G SMITH //LRL	U18
ARMENTER	62	CERN CONF 295	ARMENTEROS,MONTANET,O ANDLAU + ///CERN+CDF	U18
COLLEY	62	CERN CONF 315	D COLLEY,N GELFAND + //// COLUMBIA+RUTGERS	U18
CHADWICK	63	PL 6 309	CHADWICK,CREANELL,DAVIES,BETTINI+/OXF+PADU	U18
GOLDHABE	63	ATHENS CONF 52	SULAMITH GOLDHABER ////////////////// LRL	U18
KRAEMER	63	ATHENS CONF 130	R KRAEMER L MADANSKY + //// JOHNS HOPKINS	U18
SMITH	63	PRL 10 128	SMITH,SCHWARTZ,MILLER,KALBFLEISCH,MUF+/LRL	U18
FERROLUZ	64	PL 12 255	FERRO-LUZZI,GEORGE,HENRI,JONGEJANS+ //CERN	U18
GELSEMA	64	PL 10 341	GELSEMA,HILLYER,TERRER,WILTERS //// ZEEMAN	U18
WOJCICKI	64	PR 135 B 495	S WOJCICKI,M ALSTON,G KALBFLEISCH //// LRL	U18
WOJCICKI	64	PR 135 B 464	STANLEY G WOJCICKI ////////////////// LRL	U18
ARMENTER	65	PL 17 170	ARMENTEROS,ECHARDS,JACOBSEN + //CERN+PARIS	U18
FERROLUZ	65	NC 36 1101	FERRO-LUZZI,GEORGE,HENRI,JONGEJANS // CERN	U18
FERROLUZ	65	NC 39 417	FERRO-LUZZI,GEORGE,GOLDSCHMIDT-CLER+//CERN	U18
WANGLER	65	PR 137 B 414	WANGLER,ERWIN,WALKER ////////////// WISCONSIN	U18

QUANTUM NUMBER DETERMINATIONS NOT REFERRED TO IN THE DATA CARDS

CHINOWSK	62	PRL 9 330	CHINOWSKY,GOLDHABER,LEE,CHALLORAN //// LRL J	U18

K_c (1215)

20 KC RESON (1215, JP=) I=1/2

ARMENTER	64	DUBNA CONF 1 577	ARMENTEROS,EDWARDS,O ANDLAU +//// CERN+CDF	U2C
ALSO		DUBNA CONF 1 617	R ARMENTEROS (RAPPORTEUR)	U20

$K\pi\pi$ (1320)

21 K2PI (1320, JP=) I = 1/2

ALFEIDA	65	PL 16 184	ALMEIDA,ATHERTON,BYER,CORMAN,FORSON+/CAMER	U21
DE BAERE	65	CXFORD SUPPL. 53	+DEBAISIEUX,DUFOUR,JONGEJANS+ // CERN+BRUX	U21
BISHOP	66	PRL 16 1065	+GOSHAW,ERWIN,THOMPSON,WALKER,WEINBE//WISC	U21
SHEN	66	UCRL 16930--PRL	+BUTTERWORTH,FU,GOLDHABER,TRILLING // LRL	U21

K^* (1400)

22 K*(1400, JP=) I = 1/2

BACIER	65	PL 19 612	BADIER,DEMCULIN,GOLDBERG+//EP+SACLY+ZEEMAN	U22
HAQUE	65	PL 14 338	HAQUE,SCOTTER + /////BIRM,IMP COL+OXF+RUTH	U22
HARDY	65	PRL 14 401	HARDY,CHUANG,CAHL,HESS,KIRZ,MILLER //// LRL	U22
FOCARDI	65	PL 16 351	FOCARDI,MINGUZZI RANZI,SERRA+ /BOLOGNA+CERN	U22
BISHOP	66	PRL 16 1065	BISHOP,GOSHAW,ERWIN,THOMPSON+ // WISCONSIN	U22
DUBAL	66	MAGLIC PREPRINT	BAREYRE,BRIEMAN,CHIKOVANI,MAGLIC + //CERN	U22
SHEN	66	BERKELEY CONF	+BUTTERWORTH,FU,GOLDHABER,YAGODIAN+ //LRL	U22
AND	66	PRIVATE COMMUN.	G GOLDHABER //LRL	U22

$K\pi\pi$ (1800)

U23 K2PI (1800, JP=) I = 1/2

BARTSCH	66	CERN TC PHYS-15 SUBMITTED TO PL	DEUTSCHMANN,GROTE,PORRISCH,+ //ABCLIC)V	U23 U23
DUBAL	66	MAGLIC PREPRINT	BAREYRE,BRIEMAN,CHIKOVANI,MAGLIC + //CERN	U23

$K^*_{3/2}$ (1175)

24 K*3/2 (1175, JP=) I = 3/2 ?

WANGLER	64	PL 9 71	T P WANGLER,A R ERWIN,W C WALKER //WISCONS	U24
MILLER	65	PL 15 74	MILLER,MCVAGS,PCILWAIN,WALFREY +/// PURDUE	U24
ROSENFEL	65	CXFORD CONF 58 FOR SLIGHT EVID.	A H ROSENFELD ////////////////// LRL--RVUE FOR K*PI(1175) WITH I = 3/2 SEE BISHOP 66	U24 U24
BISHOP	66	PRL 16 1065	+GOSHAW,ERWIN,THOMPSON,WALKER,WEINBE//WISC I	U24

$K^*_{3/2}$ (1270)

25 K*3/2 (1270, JP=) I = 3/2

BOCK	64	PL 12 65	BOCK,FRENCH,KIRSCH,BACIER+//CERN+PAR+ LCNC	U25
ROSENFEL	65	CXFORD CONF 58	A H ROSENFELD ////////////////// LRL--RVUE	U25

K^+K^+ (1055)

29 K+K+ (1055, JP=) I=1 S=2

FERROLUZ	65	PL 17 155	FERRO-LUZZI,GEORGE,HENRI,JONGEJANS+ //CERN	U29

K^+K^+ (1280)

30 K+K+ (1280, JP=) I=1 S=2

FERROLUZ	65	PL 17 155	FERRO-LUZZI,GEORGE,HENRI,JONGEJANS+ //CERN	U30
ROSENFEL	65	CXFORD CONF 58	A H ROSENFELD ////////////////// LRL--RVUE	U3C
ERWIN	66	PRL 16 1063	A R ERWIN,W D WALKER,A WEINBERG//WISCONSIN	U30

CCDE EVENTS QUANTITY ERRCR+ ERRCR- REFERENCE YR TECH SIGA COMMENTS DATE
ABOVE BACKGROUND PUNCHED

N ANY SYMBOL IN COLUMN 8 INDICATES DATA IGNORED BY AVERAGING PROGRAMS

N^*_α(1400)

61 N*1/2(1400, JP=1/2+) I=1/2 P11

61 N*1/2(1400) MASS (MEV)

U61M	*	1400.C	APPROX.		CCCCCNI	64 CNTR	INEL P-P		
U61M		1512.C			AUVIL	64 RVUE	PHASE-SHIFT AN.		7/66
U61M	*	1430.C	APPROX.		AAKENBRAA	65 CNTR	INEL P-P 7 GEV		7/66
U61M		1497.C			RCPER	65 RVUE	PHASE-SHIFT ANAL		
U61M	*	1425.C	14.C		AGELMAA	65 RVUE			
U61M	*	1400.C	APPROX.		BELLETTIA	65 CNTR	INEL P-P AND P-D		7/66
U61M		1400.C			BAREYRE	65 RVUE	PHASE-SHIFT ANAL		7/66
U61M		1360.C			BRANDSEN	65 RVUE	PHASE-SHIFT ANAL		7/66

61 N*1/2(1400) WIDTH (MEV)

U61W	260.C		AUVIL	64 RVUE	PHASE-SHIFT AN. 7/66
U61W	210.C		BAREYRE	65 RVUE	PHASE-SHIFT ANAL 7/66
U61W	210.C		BRANDSEN	65 RVUE	PHASE-SHIFT AN. 7/66

61 N*1/2(1400) PARTIAL DECAY MODES

U61P1	N*1/2(1400) INTO PI N	S 0516
U61P2	N*1/2(1400) INTO N PI PI	S16S 0S 0
U61P3	N*1/2(1400) INTO N*3/2(1236) PI	U01S 0

61 N*1/2(1400) BRANCHING RATIOS

U61R1	N*1/2(1400) INTO (PI N)/TOTAL				(P11)/TOTAL	
U61R1	0.6		AUVIL	64 RVUE	PHASE-SHIFT AN.	7/66
U61R1	0.7		BAREYRE	65 RVUE	PHASE-SHIFT ANAL	7/66
U61R1	0.6		BRANDSEN	65 RVUE	PHASE-SHIFT AN.	7/66

N^*_β(1570)

62 N*1/2(1550, JP=1/2-) I=1/2 S11

62 N*1/2(1550) MASS (MEV)

U62M		1560.C			BAREYRE	65 RVUE	PHASE-SHIFT ANAL		7/66
U62M	*	1510.C	APPROX		BRANDSEN	65 RVUE	PHASE-SHIFT AN.		7/66
U62M	N	1570.C			MICHAEL	66 RVUE	PHASE-SHIFT ANAL		7/66
	N	ABOVE PAPER USES ANALYSIS OF BAREYRE.							

62 N*1/2(1550) WIDTH (MEV)

U62W	N	130.C	MICHAEL	66 RVUE	PHASE-SHIFT ANAL. 7/66
	N	ABOVE PAPER USES ANALYSIS OF BAREYRE.			

62 N*1/2(1550) PARTIAL DECAY MODES

U62P1	N*1/2(1550) INTO PI N	S 0516
U62P2	N*1/2(1550) INTO N ETA	S17S14
U62P3	N*1/2(1550) INTO N PI PI	S16S 0S 0
U62P4	N*1/2(1550) INTO N*3/2(1236) PI	U01S 0

62 N*1/2(1550) BRANCHING RATIOS

U62R1	N*1/2(1550) INTO (PI N)/TOTAL				(P11)/TOTAL	
U62R2	N*1/2(1550) INTO (N ETA)/TOTAL				(P21)/TOTAL	
U62R2 *	SEEN, NO RATIO QUOTED		BACCI	66 CNTR	PHOTOPRODUCTION	7/66
U62R2 *	SEEN,NO RATIO QUOTED		PREPOST	65 CNTR	PHOTOPROD.	7/66

N^*_γ(1518)

63 N*1/2(1518, JP=3/2-) I=1/2 D13

63 N*1/2(1518) MASS (MEV)

U63M	*	1518.C	1C.C		BELLETTIA	63 CNTR	PI+ PHOTOPROD.		
U63M		1525.C			AUVIL	64 RVUE	PHASE-SHIFT AN.		7/66
U63M		1530.C			BAREYRE	65 RVUE	PHASE-SHIFT ANAL		7/66
U63M		1527.C			BRANDSEN	65 RVUE	PHASE-SHIFT AN.		7/66

63 N*1/2(1518) WIDTH (MEV)

U63W	*	8C.C	APPROX.		BELLETTIA	63 CNTR	PI+ PHOTOPROD.		
U63W		8C.C			AUVIL	64 RVUE	PHASE-SHIFT AN.		7/66
U63W		75.C			BAREYRE	65 RVUE	PHASE-SHIFT ANAL		7/66
U63W		1C5.C			BRANDSEN	65 RVUE	PHASE-SHIFT AN.		7/66

63 N*1/2(1518) PARTIAL DECAY MODES

U63P1	N*1/2(1518) INTO PI N	S 0516
U63P2	N*1/2(1518) INTO N ETA	S17S14
U63P3	N*1/2(1518) INTO N PI PI	S16S 0S 0
U63P4	N*1/2(1518) INTO N*3/2(1236) PI	U01S 0

63 N*1/2(1518) BRANCHING RATIOS

U63R1	N*1/2(1518) INTO (PI N)/TOTAL				(P11)/TOTAL	
U63R1	0.5		AUVIL	64 RVUE	PHASE-SHIFT AN.	7/66
U63R1	0.5		BAREYRE	65 RVUE	PHASE-SHIFT ANAL	7/66
U63R1	0.5		BRANDSEN	65 RVUE	PHASE-SHIFT AN.	7/66
U63R2	N*1/2(1518) (N*3/2(1236) PI)/TOTAL				(P41)/TOTAL	
U63R2	SEEN		KIRZ	63 HBC		
U63R2	SEEN		CROLCH	65 HBC		

N^*_β(1700)

64 N*1/2(1700, JP=1/2-) I=1/2 S11

64 N*1/2(1700) MASS (MEV)

U64M	*	1700.C		APPROX	BAREYRE	65 RVUE	PHASE-SHIFT ANAL		7/66
U64M	*	1710.C		APPROX	BRANDSEN	65 RVUE	PHASE-SHIFT AN.		7/66
U64M	N	1700.C			MICHAEL	66 RVUE	PHASE-SHIFT ANAL		7/66
	N	ABOVE PAPER USES ANALYSIS OF BAREYRE.							

64 N*1/2(1700) WIDTH (MEV)

U64W	N	240.C		MICHAEL	66 RVUE	PHASE-SHIFT ANAL 7/66
	N	ABOVE PAPER USES ANALYSIS OF BAREYRE.				

64 N*1/2(1700) PARTIAL DECAY MODES

U64P1	N*1/2(1700) INTO PI N	S 0516
U64P2	N*1/2(1700) INTO N ETA	S17S14
U64P3	N*1/2(1700) INTO LAMBDA K	S18S11
U64P4	N*1/2(1700) INTO N PI PI	S16S 0S 0
U64P5	N*1/2(1700) INTO N*3/2(1236) PI	U01S 0

64 N*1/2(1700) BRANCHING RATIOS

U64R1	N*1/2(1700) INTO (PI N)/TOTAL				(P11)/TOTAL	
U64R1	0.9	APPROX	MICHAEL	66 RVUE	PHASE-SHIFT AN.	7/66

N^*_β(1688)

65 N*1/2(1688, JP=5/2-) I=1/2 D15

65 N*1/2(1688) MASS (MEV)

U65M		1674.C			DUKE	65 CNTR	PI+- P EL CSIG,P		7/66
U65M		1650.C			BAREYRE	65 RVUE	PHASE-SHIFT ANAL		7/66
U65M	*	1650.C		APPROX	BRANDSEN	65 RVUE	PHASE-SHIFT AN.		7/66

65 N*1/2(1688) WIDTH (MEV)

U65W	100.C		DUKE	65 CNTR		7/66
U65W	120.C		BAREYRE	65 RVUE	PHASE-SHIFT ANAL	7/66
U65W	60.C		BRANDSEN	65 RVUE	PHASE-SHIFT AN.	7/66

65 N*1/2(1688) PARTIAL DECAY MODES

U65P1	N*1/2(1688) INTO PI N	S 0516
U65P2	N*1/2(1688) INTO N ETA	S17S14
U65P3	N*1/2(1688) INTO LAMBDA K	S18S11
U65P4	N*1/2(1688) INTO N PI PI	S16S 0S 0
U65P5	N*1/2(1688) INTO N*3/2(1236) PI	U01S 0

65 N*1/2(1688) BRANCHING RATIOS

U65R1	N*1/2(1688) INTO (PI N)/TOTAL				(P11)/TOTAL	
U65R1	0.42		DUKE	65 CNTR		7/66
U65R1	0.35		BAREYRE	65 RVUE	PHASE-SHIFT ANAL	7/66
U65R1	0.35		BRANDSEN	65 RVUE	PHASE-SHIFT AN.	7/66

N^*_α(1688)

66 N*1/2(1688, JP=5/2+) I=1/2 F15

66 N*1/2(1688) MASS (MEV)

U66M		1688.C		APPROX	DUKE	65 CNTR	PI+- P EL CSIG,P		7/66
U66M		1655.C			BAREYRE	65 RVUE	PHASE-SHIFT ANAL		7/66
U66M		1685.C			BRANDSEN	65 RVUE	PHASE SHIFT ANAL		7/66

66 N*1/2(1688) WIDTH (MEV)

U66W	100.C		DUKE	65 CNTR	VERY ENERGY DEP	7/66
U66W	145.C		BAREYRE	65 RVUE	PHASE-SHIFT ANAL	7/66
U66W	90.C		BRANDSEN	65 RVUE		7/66

66 N*1/2(1688) PARTIAL DECAY MODES

U66P1	N*1/2(1688) INTO PI N	S 0516
U66P2	N*1/2(1688) INTO N ETA	S17S14
U66P3	N*1/2(1688) INTO LAMBDA K	S18S11
U66P4	N*1/2(1688) INTO N PI PI	S16S 0S 0
U66P5	N*1/2(1688) INTO N*3/2(1236) PI *	U01S 0

66 N*1/2(1688) BRANCHING RATIOS

U66R1	N*1/2(1688) INTO (PI N)/TOTAL				(P11)/TOTAL	
U66R1	0.60		DUKE	65 CNTR		7/66
U66R1	0.5		BAREYRE	65 RVUE	PHASE-SHIFT ANAL	7/66
U66R1	0.63		BRANDSEN	65 RVUE		7/66
U66R2	N*1/2(1688) INTO (N ETA)/TOTAL				(P21)/TOTAL	
U66R2	0.08	CR LESS	HEUSCH	66 SPRK	ETA PHOTOPROD.	7/66
U66R2 *	0.02	CR LESS	KRAEMER	64 HBC		
U66R3	N*1/2(1688) INTO (N*3/2(1236) PI)/TOTAL				(P51)/TOTAL	
U66R3 *	SEEN ,NO RATIO QUOTED		CROLCH	65 HBC		

CODE EVENTS ABOVE BACKGROUND | QUANTITY | ERROR+ | ERROR- | REFERENCE | YR | TECN | SIGN | COMMENTS | DATE PUNCHED

N ANY SYMBOL IN COLUMN 8 INDICATES DATA IGNORED BY AVERAGING PROGRAMS

N*(2190)

71 N=1/2(2190, JP=7/2-) I=1/2

71 N=1/2(2190) MASS (MEV)

J71M		2190.0			DIDDENS	63	CNTR	PI+- P TOTAL	
J71M		2210.0			HOHLER	64	RVUE	DATA + DISP REL	
U71M		2190.0		APPROX	YOKOSAWA	66	CNTR	PI- P DSIG + POL	7/66

71 N=1/2(2190) WIDTH (MEV)

U71W		200.0			DIDDENS	63	CNTR		
U71W		200.0			HOHLER	64	RVUE		7/66
J71W		220.0		APPROX	YOKOSAWA	66	CNTR		7/66

71 N=1/2(2190) PARTIAL DECAY MODES

U71P1	N=1/2(2190)	INTO PI N	S 8S16
J71P2	N=1/2(2190)	INTO LAMBDA K	S18S11

71 N=1/2(2190) BRANCHING RATIOS

J71R1		N=1/2(2190)	INTO (PI N)/TOTAL					(P1)/TOTAL	
U71R1		0.3		APPROX	DIDDENS	63	CNTR		7/66
U71R1		0.3		APPROX	YOKOSAWA	66	CNTR		7/66

N*(2650)

72 N=1/2(2650, JP=) I=1/2

72 N=1/2(2650) MASS (MEV)

J72M	*	2700.0			ALVAREZ	64	CNTR	PI PHOTOPROD	
J72M	*	2600.0		APPROX	WAHLIG	64	SPRK C	PI-P CH EX	
U72M		2660.0			HOHLER	64	RVUE	DATA + DISP REL	
U72M		2649.0	10.0		CITRON	66	CNTR	PI+- P TOTAL	7/66

72 N=1/2(2650) WIDTH (MEV)

U72W	*	100.0			ALVAREZ	64	CNTR		
U72W		200.0			HOHLER	64	RVUE		7/66
U72W		360.0	20.0		CITRON	66	CNTR		7/66

72 N=1/2(2650) PARTIAL DECAY MODES

U72P1	N=1/2(2650)	INTO PI N	S 8S16
U72P2	N=1/2(2650)	INTO LAMBDA K	S18S11

72 N=1/2(2650) BRANCHING RATIOS

U72R1		N=1/2(2650)	INTO (PI N)/TOTAL					(P1)/TCTAL	
J72R1		0.0703	0.0045		CITRON	66	CNTR	ASSUMING J=11/2	7/66

N*(3030)

73 N=1/2(3030, JP=) I=1/2
EVIDENCE GOOD BUT NOT OVERWHELMING.
OMITTED FROM TABLE.

73 N=1/2(3030) MASS (MEV)

U73M		3080.0			HOHLER	64	RVUE	DATA + DISP REL	7/66
J73M		3030.0			CITRON	66	CNTR	PI+- P TOTAL	7/66

73 N=1/2(3030) WIDTH (MEV)

U73W		400.0			CITRON	66	CNTR		7/66

73 N=1/2(3030) PARTIAL DECAY MODES

U73P1	N=1/2(3030)	INTO PI N	S 8S16

73 N=1/2(3030) BRANCHING RATIOS

U73R1		N=1/2(3030)	INTO (PI N)/TOTAL					(P1)/TOTAL	
U73R1		0.0070			CITRON	66	CNTR	ASSUMING J=15/2	7/66

N*(3245)

74 N= /2(3245, JP=)
EVIDENCE GOOD BUT NOT OVERWHELMING. I-SPIN NOT KNOWN BUT NARROW WIDTH PRECLUDES IDENTIFICATION WITH N=3/2(3230). OMITTED FROM TABLE.

74 N= /2(3245) MASS (MEV)

U74M		3245.0	10.0		KORMANYOS	66	CNTR	PI-P EL AT 180 D	7/66

74 N= /2(3245) WIDTH (MEV)

U74W		35.0	OR LESS		KORMANYOS	66	CNTR		7/66

74 N= /2(3245) PARTIAL DECAY MODES

U74P1	N= /2(3245)	INTO PI N	S 8S16

REFERENCES ON BARYON RESONANCES

N^*_α (1400)

61 N=1/2(1400, JP=1/2+) I=1/2 P11

COCCONI	64	PL B 134	LILLETHUN,SCARLCA,STAHLBRANDT,TING,+//CERN U61
AUVIL	64	PL 12 76	+LOVELACE, OCONNACHIE, LEA //IPPCOL,UNICOL IJP U61
ANKENBRA	65	NC 35 1052	ANKENBRANDT,CLYCE,CORK,KEEFE,KERTH,+ //LRL U61
ROPER	65	PR 138 B15C	LC ROPER,PP WRIGHT,BT FELD //LRL(LVMR),MIT IJP U61
ADELMAN	65	PRL 14 1043	S L ADELMAN //CAMBRIDGE U61
BELLETTI	65	PL 18 167	BELLETTINI,CCCCCNI,CICCENS, + //CERN U61
BAREYRE	65	PL 18 342	+ BRICKMAN, STIRLING, VILLET //SACLAY IJP U61
BRANDSEN	65	PR 139 B1566	BRANDSEN,CCCNAELL,MCORMCUSE //CURHAM,RTHFD IJP U61

PAPER NOT REFERRED TO IN DATA CARDS.
(REPLACED BY ROPER 65.)

ROPER	64	PRL 12 340	L C ROPER //LRL(LVMR) IJP U61

N^*_β (1570)

62 N=1/2(1570, JP=1/2-) I=1/2 S11

BAREYRE	65	PL 18 342	+ BRICKMAN, STIRLING, VILLET //SACLAY IJP U62
BRANDSEN	65	PR 139 B1566	BRANDSEN,OCCNAELL,MCORMCUSE //DURHAM,RTHFD IJP U62
PREPOST	65	HAMBURG CONF	PREPOST, LUACEY, CUTKA //STANFORD U62
BACCI	66	PRL 16 157	+PENSC,SALVINI,MENCUCCINI,+//ROME,FRASCATI U62
MICHAEL	66	PL 21 93	C MICHAEL //CXF U62

N^*_γ (1518)

SEE LAST EDITION (RMP 37, 633, 1965) FOR EARLIER REFERENCES.

63 N=1/2(1518, JP=3/2-) I=1/2 D13

BELLETTI	63	NC 25 1195	BELLETTINI, + //PISA,FIRENZE,WESTFIELD U63
KIRZ	63	PR 130 2461	J KIRZ, J SCHWARTZ, R D TRIPP //LRL U63
AUVIL	64	PL 12 76	+LOVELACE, OCONNACHIE, LEA //IPPCOL,UNICOL IJP U63
BAREYRE	65	PL 18 342	+ BRICKMAN, STIRLING, VILLET //SACLAY IJP U63
BRANDSEN	65	PL 19 420	BRANDSEN,CCCNAELL,MCORMCUSE //DURHAM,RTHFD IJP U63
CRCUCH	65	CESY CONF	CRCUCH, HARGRAVES + // BRC+CEA+HAM+PA U63

N^*_β (1700)

64 N=1/2(1700, JP=1/2-) I=1/2 S11

BAREYRE	65	PL 18 342	+ BRICKMAN, STIRLING, VILLET //SACLAY IJP U64
BRANDSEN	65	PL 19 420	BRANDSEN,CCCNAELL,MCORMCUSE //DURHAM,RTHFD IJP U64
MICHAEL	66	PL 21 93	C MICHAEL //CXF U64

N^*_β (1688)

65 N=1/2(1688, JP=5/2-) I=1/2 D15

CUKE	65	PRL 15 466	+JONES,KEPP,MURPHY,FRENTICE, + //RTHFD,OXF IJP U65
BAREYRE	65	PL 18 342	+ BRICKMAN, STIRLING, VILLET //SACLAY IJP U65
BRANDSEN	65	PL 19 420	BRANDSEN,CCCNAELL,MCORMCUSE //DURHAM,RTHFD IJP U65

SEE LAST EDITION (RMP 37, 633, 1965) FOR EARLIER REFERENCES.

N^*_α (1688)

66 N=1/2(1688, JP=5/2+) I=1/2 F15

CUKE	65	PRL 15 466	+JONES,KEPP,MURPHY,FRENTICE, + //RTHFD,OXF IJP U66
BAREYRE	65	PL 18 342	+ BRICKMAN, STIRLING, VILLET //SACLAY IJP U66
BRANDSEN	65	PL 19 420	BRANDSEN,CCCNAELL,MCORMCUSE //DURHAM,RTHFD IJP U66
KRAEMER	64	PR 136 B962	KRAEMER, //PERKINS,NWEST,WCST U66
CRCUCH	65	CESY CONF	CRCUCH, HARGRAVES + // BRC+CEA+HAM+PA U66
HEUSCH	66	BERKELEY CONF.	HEUSCH, PRESCOTT, CASHER //CALTECH U66

N*(2190)

71 N=1/2(2190, JP=7/2-) I=1/2

CICCENS	63	PRL 10 262	+JENKINS, KYCIA, RILEY	//ENL	I U71
HOHLER	64	PL 12 145	G HOHLER, J GIESECKE	//KARLSRUHE	I U71
YOKOSAWA	66	PRL 16 714	+SUBA,HILL,STERLING,BECTH	//ARG,CMU	JP U71

QUANTUM NUMBER DETERMINATIONS NOT REFERRED TO IN DATA CARDS.

CARROLL	66	PRL 16 288	+CORBETT,DAMERELL,MIDDLEPAS, +	//RTHFD,OXF	J-L U71
KERPANYC	66	PRL 16 705	KERPANYCS,KRISCH,CFALLON, +	//MICH,ARG	P U71
BARGER	66	PRL 16 913	V BARGER, C CLINE	//WISC	P U71

N*(2650)

72 N=1/2(2650, JP=) I=1/2

ALVAREZ	64	PRL 12 710	+BAR-YAM,KEPA,LUCKEY,CSECRAE, + //MIT,CEA U72
WAHLIG	64	PRL 12 103	+PANARELLI,SCCICKSCN,FACKLER,WARD, + //PIT U72
HOHLER	64	PL 12 149	G HOHLER, J GIESECKE //KARLSRUHE I U72
CITRON	66	PR 144 1101	+GALBRAITH,KYCIA,LECNTIC,PHILLIPS, + //ENL I U72

PAPER NOT REFERRED TO IN DATA CARDS.
(CITRON 64 IS REPLACED BY CITRON 66.)

CITRON	64	PRL 13 205	+GALBRAITH,KYCIA,LECATIC,PHILLIPS, + //ENL I U72

N*(3030)

73 N=1/2(3030, JP=) I=1/2

HOHLER	64	PL 12 149	G HOHLER, J GIESECKE //KARLSRUHE I U73
CITRON	66	PR 144 1101	+GALBRAITH,KYCIA,LECATIC,PHILLIPS, + //ENL I U73

N*(3245)

74 N= /2(3245, JP=) I=

KORMANYO	66	PRL 16 709	KERPANYCS,KRISCH,CFALLON, + //MICH,ARG U74

DATA ON BARYON RESONANCES

CODE | EVENTS ABOVE BACKGROUND | QUANTITY | ERROR+ | ERROR- | REFERENCE | YR | TECN | SIGN | COMMENTS | DATE PUNCHED

N ANY SYMBOL IN COLUMN 8 INDICATES DATA IGNORED BY AVERAGING PROGRAMS

Δ (1236)

81 N=3/2(1236, JP=3/2+) I=3/2

81 N=3/2(1236) MASS (MEV)

U81M	*	1234.0			ROPER	65	RVUE	O++	PHASE-SHIFT ANAL	
U81M++		1236.0	0.55		OLSSON	65	RVUE	++	TOTAL-SIGMA DATA	
U81M++	*	1232.0	6.0		FERRO-LUZ	65	HBC	++	K+P TO KO P PI+	
U81M++	*	1233.4	4.4		GIDAL	66	DBC	++	D D TO NN(NN) PI	7/66
U81M++		1236.0			DEANS	66	RVUE	++	PI+P TOTAL	7/66
U81M0		1236.45	0.65		OLSSON	65	RVUE	0		
U81M-	*	1241.3	5.1		GIDAL	66	DBC	-		7/66

81 N=0(0) - N=(++) MASS DIFFERENCE (MEV)

U81D	0.45	0.85		OLSSON	65	RVUE	SEE MASS CARDS

81 N=(-) - N=(++) MASS DIFFERENCE (MEV)

U81D	7.9	6.8		GIDAL	66	DBC	SEE MASS CARDS

81 N=3/2(1236) WIDTH (MEV)

U81W++		120.0	2.0		OLSSON	65	RVUE	++	
U81W++	*	125.0	30.0		FERRO-LUZ	65	HBC	++	
U81W++	*	124.0	14.0		GIDAL	66	DBC	++	7/66
U81W++		121.0			DEANS	66	RVUE	++	PI+P TOTAL 7/66
U81W0		119.6	2.4		OLSSON	65	RVUE	0	
U81W-	*	149.0	18.0		GIDAL	66	DBC	-	7/66

81 N=3/2(1236) PARTIAL DECAY MODES

U81P1	N=3/2(1236) INTO PI N $ 8S16

Δ (1670)

82 N=3/2(1670, JP=1/2-) I=3/2

82 N=3/2(1670) MASS (MEV)

U82M	1648.0	12.0		DEVLIN	65	CNTR	PI+- P TOTAL	
U82M	1665.0			BAREYRE	65	RVUE	PHASE SHIFT ANAL	7/66
U92M	1692.0			DONNACHIE	65	RVUE	PHASE S + DISP R	7/66

82 N=3/2(1670) WIDTH (MEV)

U82W	201.0	74.0		DEVLIN	65	CNTR	VERY ASYMMETRIC	
U82W	130.0			BAREYRE	65	RVUE		7/66
U82W	230.0			DONNACHIE	65	RVUE		7/66

82 N=3/2(1670) PARTIAL DECAY MODES

U82P1	N=3/2(1670) INTO PI N $ 8S16

82 N=3/2(1670) BRANCHING RATIOS

U82R1	N=3/2(1670) INTO (PI N)/TOTAL					(P1)/TOTAL
U82R1	0.56			DEVLIN	65	CNTR	
U82R1	0.33			BAREYRE	65	RVUE	7/66
U82R1	0.44			DONNACHIE	65	RVUE	7/66

Δ (1920)

83 N=3/2(1920, JP=7/2+) I=3/2

83 N=3/2(1920) MASS (MEV)

U83M		1922.0	APPROX		COOL	56	CNTR	PI+ P TOTAL 7/66
U83M		1912.0	15.0		BRISSON	61	CNTR	PI+ P TOTAL 7/66
U83M	N	1956.0			LAYSON	63	RVUE	PI P TOTAL, EL 7/66
	N	ASSUMES AN N=3/2(1855).						
U83M		1920.0			HOHLER	64	RVUE	DATA + DISP REL 7/66
U83M		1900.0	9.0		DEVLIN	65	CNTR	PI+ P TOTAL
U83M		1920.0	APPROX		DUKE	65	CNTR	PI+- P EL, POLAR 7/66
U83M		1950.0	APPROX		YOKOSAWA	66	CNTR	PI- P DSIG + POL 7/66

83 N=3/2(1920) WIDTH (MEV)

U83W	170.0			HOHLER	64	RVUE		7/66
U83W	256.0	39.0		DEVLIN	65	CNTR		
U83W	170.0			DUKE	65	CNTR		7/66
U83W	200.0	APPROX		YOKOSAWA	66	CNTR		7/66

83 N=3/2(1920) PARTIAL DECAY MODES

U83P1	N=3/2(1920) INTO PI N $ 8S16

83 N=3/2(1920) BRANCHING RATIOS

U83R1	N=3/2(1920) INTO (PI N)/TOTAL						(P1)/TOTAL	
U83R1	N	0.33			LAYSON	63	RVUE	7/66
	N	ASSUMES AN N=3/2(1855).						
U83R1		0.73	OR LESS		HOHLER	63	RVUE	DATA + DISP REL 7/66
U83R1		0.67	OR LESS		AUVIL	64	RVUE	PI+ P ELASTIC
U83R1		0.57	0.12		DEVLIN	65	CNTR	
U83R1		0.41			DUKE	65	CNTR	VERY ENERGY DEP 7/66
U83R1		0.4	APPROX		YOKOSAWA	66	CNTR	7/66

Δ (2420)

84 N=3/2(2420, JP= +) I=3/2

84 N=3/2(2420) MASS (MEV)

U84M		2360.0			DIDDENS	63	CNTR	PI+ P TOTAL
U84M	*	2520.0	40.0		ALVAREZ	64	CNTR	PI PHOTOPROD 7/66
U84M	*	2400.0	APPROX		WAHLIG	64	SPRK	0 PI-P CH EX
U84M		2440.0			HOHLER	64	RVUE	DATA + DISP REL
U84M		2423.0	10.0		CITRON	66	CNTR	PI+ P TOTAL 7/66

84 N=3/2(2420) WIDTH (MEV)

U84W	200.0			DIDDENS	63	CNTR	
U84W	245.0			HOHLER	64	RVUE	7/66
U84W	310.0	20.0		CITRON	66	CNTR	7/66

84 N=3/2(2420) PARTIAL DECAY MODES

U84P1	N=3/2(2420) INTO PI N $ 8S16
U84P2	N=3/2(2420) INTO SIGMA K S20S10

84 N=3/2(2420) BRANCHING RATIOS

U84R1	N=3/2(2420) INTO (PI N)/TOTAL						(P1)/TOTAL	
U84R1	0.067	APPROX		DIDDENS	63	CNTR	ASSUMING J=11/2	7/66
U84R1	0.113	0.0036		CITRON	66	CNTR	ASSUMING J=11/2	7/66

Δ (2850)

85 N=3/2(2850, JP=) I=3/2

85 N=3/2(2850) MASS (MEV)

U85M	*	2700.0	APPROX		WAHLIG	64	SPRK	0 PI-P CH EX
U85M		2870.0			HOHLER	64	RVUE	DATA + DISP REL
U85M		2850.0	12.0		CITRON	66	CNTR	PI+ P TOTAL 7/66
U85M		2850.0			BARDADIN	66	HBC	++ N= TO P + 3 PIS 7/66

85 N=3/2(2850) WIDTH (MEV)

U85W	400.0	40.0		CITRON	66	CNTR		7/66
U85W	150.0			BARDADIN	66	HBC	++	7/66

85 N=3/2(2850) PARTIAL DECAY MODES

U85P1	N=3/2(2850) INTO PI N $ 8S16
U85P2	N=3/2(2850) INTO P PI PI PI S16S 8S 0S 8

85 N=3/2(2850) BRANCHING RATIOS

U85R1	N=3/2(2850) INTO (PI N)/TOTAL						(P1)/TOTAL	
U85R1	0.0314	0.0025		CITRON	66	CNTR	ASSUMING J=15/2	7/66

Δ (3230)

86 N=3/2(3230, JP=) I=3/2
EVIDENCE GOOD BUT NOT OVERWHELMING.
OMITTED FROM TABLE.

86 N=3/2(3230) MASS (MEV)

U86M	3230.0			CITRON	66	CNTR	PI+ P TOTAL	7/66

86 N=3/2(3230) WIDTH (MEV)

U86W	440.0			CITRON	66	CNTR		7/66

86 N=3/2(3230) PARTIAL DECAY MODES

U86P1	N=3/2(3230) INTO PI N $ 8S16

86 N=3/2(3230) BRANCHING RATIOS

U86R1	N=3/2(3230) INTO (PI N)/TOTAL						(P1)/TOTAL	
U86R1	0.0063			CITRON	66	CNTR	ASSUMING J=19/2	7/66

$N^*_{5/2}$ (1570)

91 N=5/2(1570, JP=) I=5/2
POSSIBLE KINEMATIC EFFECT. SEE DASH 65.
OMITTED FROM TABLE.

91 N=5/2(1570) MASS (MEV)

U91M	1560.0	20.0		GOLDHABER	64	HBC	+++3.65 BEV/C PI+ P	7/66
U91M	1580.0	20.0		ALEXANDER	65	HBC	+++5.5 BEV/C P P	7/66

91 N=5/2(1570) WIDTH (MEV)

U91W	220.0	20.0		GOLDHABER	64	HBC	+++	7/66
U91W	200.0	20.0		ALEXANDER	65	HBC	+++	7/66

91 N=5/2(1570) PARTIAL DECAY MODES

U91P1	N=5/2(1570) INTO N PI PI S16S 8S 8
U91P2	N=5/2(1570) INTO N=3/2(1236) PI U81S 8

Z^*_0 (1865)

56 Z=0(1865, JP=) I=0
EVIDENCE GOOD BLT NOT OVERWHELMING.

56 Z=0(1865) MASS (MEV)

U56M	1863.0			COOL	66	CNTR +	K+ P, D TOTAL	7/66

56 Z=0(1865) WIDTH (MEV)

U56W	150.0			COOL	66	CNTR +		7/66

56 Z=0(1865) PARTIAL DECAY MODES

U56P1	Z=0(1865) INTO K N S10S17
U56P2	Z=0(1865) INTO N=3/2(1236) K U81S10

56 Z=0(1865) BRANCHING RATIOS

U56R1	Z=0(1865) INTO (K N)/TOTAL						(P1)/TOTAL	
U56R1	0.55			COOL	66	CNTR +	IF J=1/2	7/66

Z^*_1 (1910)

57 Z=1(1910, JP=) I=1
PROBABLE KN= THRESHOLD EFFECT.
OMITTED FROM TABLE.

57 Z=1(1910) MASS (MEV)

U57M	1910.0	20.0		COOL	66	CNTR	++	K+ P TOTAL 7/66

57 Z=1(1910) WIDTH (MEV)

U57W	180.0			COOL	66	CNTR	++	7/66

57 Z=1(1910) PARTIAL DECAY MODES

U57P1	Z=1(1910) INTO K N S10S16
U57P2	Z=1(1910) INTO K N PI S10S16S 9

57 Z=1(1910) BRANCHING RATIOS

U57R1	Z=1(1910) INTO (K N)/TOTAL						(P1)/TOTAL	
U57R1	0.31			COOL	66	CNTR	++ IF J=1/2	7/66

REFERENCES ON BARYON RESONANCES

AUTHOR . YR JOURNAL VOL. PAGE AUTHORS // LABORATORIES CODE

Δ (1236)

81 N*3/2(1236, JP=3/2+) I=3/2

(FOR EXTENSIVE REFERENCES TO DATA AND TO PHASE-SHIFT ANALYSES, SEE ROPER 65, ESPECIALLY APPENDIX II.)

CLSSCN	65 PRL 14 110	M G CLSSCN	//WISC	U81
FERRO-LU	65 NC 36 1101	FERRO-LUZZI,GEORGE, +	//CERN	U81
ROPER	65 PR 138 B190	L D ROPER, R M WRIGHT, B T FELD	//LRL,MIT JP	U81
GIDAL	66 PR 141 1201	G GIDAL, A KERMAN, S KIP	//LRL	U81
DEANS	66 PREPRINT	S R DEANS, W G HOLLADAY	//VANDERBILT	U81

PAPER NOT REFERRED TO IN DATA CARDS.

KLEPIKOV	60 JINR D-584 DUBNA	KLEPIKOV, MESHCHERYAKOV, SOKOLOV	//DUBNA	U81

Δ (1670)

82 N*3/2(1670, JP=1/2-) I=3/2

DEVLIN	65 PRL 14 1031	T J DEVLIN,J SCLOPCN,G BERTSCH	//PRINCETON I	U82
BAREYRE	65 PL 18 342	+ BRICKMAN, STIRLING, VILLET	//SACLAY IJP	U82
COMANCHI	65 PL 19 146	A COMANCHIE,AT LEA,C LOVELACE//UNICCL,CERN IJP		U82

PAPERS NOT REFERRED TO IN DATA CARDS.

CARRUTHE	60 PRL 4 303	P CARRUTHERS	//CORNELL I	U82
DEVLIN	62 PR 125 650	T J DEVLIN, E J MOYER, V PEREZ-MENDEZ//LRL	I	U82
HELLAND	64 PR 134 B1062	+DEVLIN,HAGGE,LONGO,MOYER,WCCO	//LRL I	U82

Δ (1920)

83 N*3/2(1920, JP=3/2+) I=3/2

COOL	56 PR 103 1082	R COOL, O PICCIONI, D CLARK	//BNL I	U83
ERISSON	61 NC 19 210	+DETOEUF,FAUR-VAIRANT,VAN ROSSUM,+//SACLAY I		U82
LAYSON	63 NC 27 724	W M LAYSON	//CERN IJ	U83
MOHLER	63 NP 40 470	G MOHLER, G EBEL	//KARLSRUHE I	U83
ALVIL	64 NC 33 473	P ALVIL, C LOVELACE	//IMPCOL IJP	U83
MOHLER	64 PL 12 149	G MOHLER, J GIESECKE	//KARLSRUHE I	U83
DEVLIN	65 PRL 14 1031	T J DEVLIN,J SCLOPCN,G BERTSCH	//PRINCETON I	U83
CUKE	65 PRL 15 468	+JONES,KEPF,MURPHY,PRENTICE, +	//RUTG,CMU IJP	U83
YOKOSAWA	66 PRL 16 714	+SUMA,HILL,STERLING,BOOTH	//ARG,CMU IJP	U83

QUANTUM NUMBER DETERMINATION NOT REFERRED TO IN DATA CARDS.

HELLAND	64 PR 134 B1062	+DEVLIN,HAGGE,LONGO,MOYER,WCCO	//LRL IJ	U83

Δ (2420)

84 N*3/2(2420, JP= +) I=3/2

CICOENS	63 PRL 10 262	+JENKINS, MYCIA, RILEY	//BNL I	U84
ALVAREZ	64 PRL 12 710	+BAR-YAM,KERN,LUCKEY,CSEGNE, +	//MIT,CERN	U84
MANLIG	64 PRL 13 103	+MANNELLI,SCOTCKSON,FACKLER,WARD, +	//MIT	U84
MOHLER	64 PL 12 149	G MOHLER, J GIESECKE	//KARLSRUHE I	U84
CITRON	66 PR 144 1101	+GALBRAITH,KYCIA,LEONTIC,PHILLIPS, +	//BNL I	U84

PAPERS NOT REFERRED TO IN DATA CARDS.
(CITRON 64 IS REPLACED BY CITRON 66.)

CITRON	64 PRL 13 205	+GALBRAITH,KYCIA,LEONTIC,PHILLIPS, +	//BNL I	U84
BARGER	66 PRL 16 913	V BARGER, D CLINE	//WISC P	U84

Δ (2850)

85 N*3/2(2850, JP=) I=3/2

MANLIG	64 PRL 13 103	+MANNELLI,SCOTCKSON,FACKLER,WARD, +	//MIT	U85
MOHLER	64 PL 12 149	G MOHLER, J GIESECKE	//KARLSRUHE I	U85
CITRON	66 PR 144 1101	+GALBRAITH,KYCIA,LEONTIC,PHILLIPS, +	//BNL I	U85
BARDADIN	66 PL 21 357	BARDADIN-OTWINOWSKA,DANYSZ, +	//WARSAW	U85

PAPER NOT REFERRED TO IN DATA CARDS.
(CITRON 64 IS REPLACED BY CITRON 66.)

CITRON	64 PRL 13 205	+GALBRAITH,KYCIA,LEONTIC,PHILLIPS, +	//BNL I	U85

Δ (3230)

86 N*3/2(3230, JP=) I=3/2

CITRON	66 PR 144 1101	+GALBRAITH,KYCIA,LEONTIC,PHILLIPS, +	//BNL I	U86

$N^*_{5/2}(1570)$

91 N*5/2(1570, JP=) I=1/2

GOLCHABE	64 DUBNA CONF I 480	G+S GOLCHABER,CHALLCRAN,SHEN	//LRL(BNL) I	U91
ALEXANDE	65 PRL 15 207	ALEXANDER,BENARY,REUTER,+	//WEIZMANN(CERN) I	U91

PAPER NOT REFERRED TO IN DATA CARDS.

DASH	65 LRL UCID-2752	J DASH, G GOLCHABER, J SWIHART	//LRL	U91

Z^*_0 (1865)

56 Z*0(1865, JP=) I=0

COOL	66 PRL 17 102	+GIACCMELLI,KYCIA,LEONTIC,LI,LUNDBY,+	//BNL I	U56

Z^*_1 (1910)

57 Z*1(1910, JP=) I=1

COOL	66 PRL 17 102	+GIACCMELLI,KYCIA,LEONTIC,LI,LUNDBY,+	//BNL I	U57

DATA ON BARYON RESONANCES

CCCE EVENTS CLNTITY ERRCR+ ERRCR- REFERENCE YR TECH SIGN COMMENTS DATE
ABOVE BACKGROUND PUNCHED

N ANY SYMBOL IN COLUMN 8 INDICATES DATA IGNORED BY AVERAGING PROGRAMS

$Y_0^*(1405)$

37 Y*0(1405, JP=1/2-) I=0

37 Y*0(1405) MASS (MEV)

J37M		1405.0			ALSTON	61	HBC	K-P TC SIG + PIS	7/66
J37M		1410.0			ALEXANDER	62	HBC	PI-P TO SIG PI K	
U37M		1405.0			ALSTON	62	HBC	K-P TC SIG + PIS	
U37M		1400.0	24.0		MUSGRAVE	65	HBC	PBAR P TO YBAR Y	7/66
J37M	*	1382.0	8.0		ENGLER	65	HOBC	PI N TO SIG PI K	7/66
J37P		1410.7	1.0		KIM	65	HBC	EFF RANGE FIT	7/66
U37M	N	1407.6	1.7		SAKITT	65	HBC	EFF RANGE FIT	7/66
	N	DATA OF SAKITT ARE USED IN FIT BY KITTEL.							
U37M		1407.5	1.2		KITTEL	66	HBC	EFF RANGE FIT	7/66

37 Y*0(1405) WIDTH (MEV)

J37W		20.0			ALSTON	61	HBC		7/66
J37W		35.0	5.0		ALEXANDER	62	HBC		
U37W		50.0			ALSTON	62	HBC		
U37W		60.0	20.0		MUSGRAVE	65	HBC		7/66
J37W	*	89.0	20.0		ENGLER	65	HOBC		7/66
J37W		37.0	3.2		KIM	65	HBC		7/66
U37W	N	28.2	4.1		SAKITT	65	HBC		7/66
	N	DATA OF SAKITT ARE USED IN FIT BY KITTEL.							
J37W		34.1	4.1		KITTEL	66	HBC		7/66

37 Y*0(1405) PARTIAL DECAY MODES

U37P1	Y*0(1405) INTO SIGMA PI	S20S 8

$Y_0^*(1520)$

38 Y*0(1520, JP=3/2-) I=0

38 Y*0(1520) MASS (MEV)

J38M		1519.4	2.0		WATSON	63	HBC	K-P ALL CHANNELS	
U38M	145	1517.2	3.0		GALTIERI	63	OBC	INVM(K-P)	
U38M		1520.0	4.0		ALMEIDA	64	HBC	INVM(K-P)	
U36M		1511.0	15.0		MUSGRAVE	65	HBC	INVM(SIGMA PI)	7/66

38 Y*0(1520) WIDTH (MEV)

J38W		16.4	2.0		WATSON	63	HBC	K-P ALL CHANNELS	
U38W		19.0	19.0		MUSGRAVE	65	HBC	INVM(SIGMA PI)	7/66

38 Y*0(1520) PARTIAL DECAY MODES

U38P1	Y*0(1520) INTO KBAR N	S11S17
U38P2	Y*0(1520) INTO SIGMA PI	S20S 8
J38P3	Y*0(1520) INTO LAMBDA PI PI	S18S 8S 8

38 Y*0(1520) BRANCHING RATIOS

U38R1	Y*0(1520) INTO (KBAR N)/TOTAL							(P1)/TOTAL	
J38R1	0.293	0.035			WATSON	63	HBC	K-P EL, CH EX	
U38R2	Y*0(1520) INTO (SIGMA PI)/TOTAL							(P2)/TOTAL	
J38R2	0.546	0.067			WATSON	63	HBC	K-P TC SIGMA PI	
U38R3	Y*0(1520) INTO (LAMBDA PI PI)/TOTAL							(P3)/TOTAL	
U38R3	0.16	0.02			WATSON	63	HBC	K-P TC LAM PI PI	
U38R4	Y*0(1520) INTO (KBAR N)/(SIGMA PI)							(P1)/(P2)	
U38R4	0.58	0.26			MUSGRAVE	65	HBC	INVM(K N,SIG PI)	7/66
U38R5	Y*0(1520) INTO (SIGMA PI)/(LAMBDA PI PI)							(P2)/(P3)	
U38R5	4.5	1.0			ARMENTERO	65	HBC		7/66

$Y_0^*(1670)$

40 Y*0(1670, JP=1/2-) I=0
ALSO POSSIBLE TO INTERPRET AS SCATTERING LENGTH EFFECT.

40 Y*0(1670) MASS (MEV)

U40M		1680.0			YUNG-CHAN	64	PBC		7/66
U40M		1670.0			BERLEY	65	HBC	K-P TO LAMDA ETA	7/66

40 Y*0(1670) WIDTH (MEV)

J40W		20.0	OR LESS		YUNG-CHAN	64	PBC		7/66
U40W		18.0			BERLEY	65	HBC		7/66

40 Y*0(1670) PARTIAL DECAY MODES

U40P1	Y*0(1670) INTO KBAR N	S11S17
U40P2	Y*0(1670) INTO LAMBDA ETA	S18S14

40 Y*0(1670) BRANCHING RATIOS

U40R1	*	Y*0(1670) INTO ((KBAR N)(LAM ETA))/TOTAL**2						(P1*P2)/TOTAL**2	
U40R1	*	0.046			BERLEY	65	HBC		7/66

$Y_0^*(1815)$

39 Y*0(1815, JP=5/2+) I=0

39 Y*0(1815) MASS (MEV)

U39M		1815.0			GALTIERI	63		K-P RVUE	7/66
U39M		1815.0			BIRGE	65	HBC	KBAR N,LAM PI PI	7/66
U39M		1820.0	5.0		TRIPP	66	HBC	K-P EL, CH EX	7/66

39 Y*0(1815) WIDTH (MEV)

U39W		70.0			GALTIERI	63		K-P RVUE	
J39W		60.0			BIRGE	65	HBC	KBAR N,LAM PI PI	7/66
U39W		45.0	5.0		TRIPP	66	HBC	K-P EL, CH EX	7/66

39 Y*0(1815) PARTIAL DECAY MODES

U39P1	Y*0(1815) INTO KBAR N	S11S17
U39P2	Y*0(1815) INTO SIGMA PI	S20S 8
U39P3	Y*0(1815) INTO LAMBDA ETA	S18S14
J39P4	Y*0(1815) INTO Y*1(1385) PI	U43S 8

39 Y*0(1815) BRANCHING RATIOS

J39R1	Y*0(1815) INTO (KBAR N)/TOTAL							(P1)/TOTAL	
U39R1	0.8				GALTIERI	63		K-P RVUE	
U39R1	0.70				TRIPP	66	HBC	K-P EL, CH EX	7/66
J39R2	Y*0(1815) INTO (SIGMA PI)/TOTAL							(P2)/TOTAL	
U39R2	0.09				TRIPP	66	HBC	K-P TC SIGMA PI	7/66
U39R3	Y*0(1815) INTO (LAMBDA ETA)/TOTAL							(P3)/TOTAL	
J39R3	0.01				TRIPP	66	HBC	K-P TC LAMDA ETA	7/66
U39R4	Y*0(1815) INTO (Y*1(1385) PI)/TOTAL								
J39R4	0.20	0.05			BIRGE	65	HBC	K-P TC Y*1 PI	7/66
U39R4	0.15				TRIPP	66	HBC	K-P TC Y*1 PI	7/66

$Y_0^*(2110)$

41 Y*0(2110, JP=3/2-) I=0

41 Y*0(2110) MASS (MEV)

U41M	*	2097.0	6.0		BOCK	65	HBC	INVM(K N (PI))	7/66
U41M		2100.0	20.0		COOL	66	CNTR	K-P TOTAL	7/66
U41M		2120.0	20.0		WOHL	66	HBC	K-P CH EX	7/66

41 Y*0(2110) WIDTH (MEV)

U41W	*	24.0	14.0	24.0	BOCK	65	HBC	INVM(K N (PI))	7/66
J41W		160.0			COOL	66	CNTR	K-P TOTAL	7/66
U41W		145.0			WOHL	66	HBC	K-P CH EX	7/66

41 Y*0(2110) PARTIAL DECAY MODES

U41P1	Y*0(2110) INTO KBAR N	S11S17
U41P2	Y*0(2110) INTO SIGMA PI	S20S 8

41 Y*0(2110) BRANCHING RATIOS

U41R1	Y*0(2110) INTO (KBAR N)/TOTAL							(P1)/TOTAL	
J41R1	0.39				COOL	66	CNTR	K-P TOTAL	7/66
U41R1	0.25				WOHL	66	HBC	K-P CH EX	7/66

$Y_0^*(2340)$

42 Y*0(2340, JP=) I=0
EVIDENCE GOOD BUT NOT OVERWHELMING.
OMITTED FROM TABLE.

42 Y*0(2340) MASS (MEV)

U42M		2340.0	20.0		COOL	66	CNTR	K-P, D TOTAL	7/66

42 Y*0(2340) WIDTH (MEV)

U42W		105.0			COOL	66	CNTR		7/66

42 Y*0(2340) PARTIAL DECAY MODES

U42P1	Y*0(2340) INTO KBAR N	S11S17

42 Y*0(2340) BRANCHING RATIOS

U42R1	Y*0(2340) INTO (KBAR N)/TOTAL							(P1)/TOTAL	
U42R1	0.102				COOL	66	CNTR	ASSUMING J=9/2	7/66

$Y_1^*(1385)$

43 Y*1(1385, JP=3/2+) I=1

43 Y*1(1385) MASS (MEV)
(* ONLY UNSTARRED DATA -- CAREFUL ATTEMPTS TO OBTAIN SEPARATE CHARGE-STATE PASSES -- ARE USED.)

U43M	*	141	1384.0		ALSTON	60	HBC	+- K-P 1.15 BEV/C	
U43M-	*	93	1382.0	3.0	DAHL	61	OBC	- K-D 0.45 BEV/C	
U43M	*	38	1384.0		MARTIN	61	HBC	C+ K2O P .98 BEV/C	
J43M	*		1385.0		BERGE	61	HBC	+- K-P .4-.85 BEV/C	
U43M	*		1392.0	7.0	COLLEY	62	PBC	0- PI- PRP 2. BEV/C	
U43M0	*	106	1381.0	4.0	CURTIS	63	SPRK	C PI-P 1.5 BEV/C	
U43M+	*	80	1384.0	4.0	FOELSCHE	64	HBC	+	
J43M	*		1392.0	10.0	MUSGRAVE	65	HBC	+-OPBAR P TO YBAR Y	7/66
U43M	*		1389.0	3.0	BALTAY	65	HBC	+- PBAR P TO YBAR Y	7/66
U43M+		154	1376.0	3.0	ELY	61	PBC	+ K-P 1.11 BEV/C	
U43M+		170	1375.0	3.9	COOPER	64	HBC	+ K-P 1.45 BEV/C	
J43M+		859	1381.0	1.6	HUWE	64	HBC	+ K-P 1-1.7 BEV/C	
U43M+			1382.0	1.0	ARMENTERO	65	HBC	+ K-P .9-1.2 BEV/C	
U43M+			1378.0	5.0	LONDON	66	HBC	+ K-P 2.24 BEV/C	7/66
U43M-		224	1376.0	3.0	ELY	61	PBC	-	
J43M-		200	1392.0	6.2	COOPER	64	HBC	-	
U43M-		1086	1389.3	1.5	HUWE	64	HBC	-	
U43M-			1384.0	1.0	ARMENTERO	65	HBC	-	
U43M-			1389.0	9.0	LONDON	66	HBC	-	7/66

CODE EVENTS QUANTITY ERROR+ ERROR- REFERENCE YR TECH SIGN COMMENTS DATE PUNCHED
ABOVE BACKGROUND

N ANY SYMBOL IN COLUMN 6 INDICATES DATA IGNORED BY AVERAGING PROGRAMS

---

43 Y*(-) - Y*(+) MASS DIFFERENCE (MEV)

U43D 9.0 6.0 LONDON 66 HBC +- LAMBDA 3 PI EVTS 7/66

---

43 Y*1(1385) WIDTH (MEV)
(* ONLY UNSTARRED DATA -- CAREFUL ATTEMPTS TO OBTAIN SEPARATE CHARGE-STATE WIDTHS -- ARE USED.)

U43W	*	64.0		ALSTON	60 HBC	+-		
U43W	*	40.0		DAHL	61 DBC	-		
U43W	*	20.0	OR LESS	MARTIN	61 HBC	0+		
U43W	*	40.0		BERGE	61 HBC	+-		
U43W	*	80.0	10.0	COLLEY	62 PBC	C-		
U43W	*	30.0	9.0	CURTIS	63 SPRK	C		
U43W	*	30.0	7.0	FOELSCHE	64 HBC	+		
U43W	*	38.0	9.0	MUSGRAVE	65 HBC	+-0		7/66
U43W	*	26.0	5.0	BALTAY	65 HBC	+-		7/66
U43W+		48.0	8.0	ELY	61 PBC	+		
U43W+		51.0	10.0	COOPER	64 HBC	+		
U43W+		46.5	3.0	HUWE	64 HBC	+		
U43W+		32.0	3.0	ARMENTERO	65 HBC	+		
U43W-		66.0	10.0	ELY	61 PBC	-		
U43W-		88.0	10.0	COOPER	64 HBC	-		
U43W-		62.0	7.0	HUWE	64 HBC	-		
U43W-		38.0	3.0	ARMENTERO	65 HBC	-		

---

43 Y*1(1385) PARTIAL DECAY MODES

U43P1	Y*1(1385) INTO LAMBDA PI	S1S S
U43P2	Y*1(1385) INTO SIGMA PI	S2S S

---

43 Y*1(1385) BRANCHING RATIOS

U43R1	Y*1(1385) INTO (SIGMA PI)/(LAMBDA PI)					(P2)/(P1)		
U43R1		0.04	0.04	BASTIEN	61 HBC	+-		
U43R1	*	0.14	OR LESS	ALSTON	62 HBC	+-0		
U43R1		0.09	0.04	HUWE	64 HBC	+-		
U43R1		0.163	0.035	ARMENTERO	65 HBC	+-		7/66
U43R1		0.08	0.06	LONDON	66 HBC	+		7/66

Y*1(1660)

44 Y*1(1660, JP=3/2) I=1

44 Y*1(1660) MASS (MEV)

U44M		1685.0		ALEXANDER	62 HBC	C-	INVM(LAM,SIG PI)	
U44M		1660.0	10.0	ALVAREZ	63 HBC	+		
U44M		1660.0		BERLEY	64 HBC	0	K-P TO LAM PIO	7/66
U44M		1645.0	7.0	LEVEQUE	65 HBC	+	K-P TO Y*1660 PI	7/66

---

44 Y*1(1660) WIDTH (MEV)

U44W		45.0		ALEXANDER	62 HBC	C-	INVM(LAM,SIG PI)	
U44W		40.0	10.0	ALVAREZ	63 HBC	+		
U44W		60.0		BERLEY	64 HBC	0	K-P TO LAM PIO	7/66
U44W		55.0	10.0	LEVEQUE	65 HBC	+		7/66

---

44 Y*1(1660) PARTIAL DECAY MODES

U44P1	Y*1(1660) INTO KBAR N	S11S17
U44P2	Y*1(1660) INTO LAMBDA PI	S1S S
U44P3	Y*1(1660) INTO SIGMA PI	S2CS S
U44P4	Y*1(1660) INTO LAMBDA PI PI	S1S S S S
U44P5	Y*1(1660) INTO SIGMA PI PI	S2S S S S
U44P6	Y*1(1660) INTO Y*1(1385) PI	U43S S
U44P7	Y*1(1660) INTO Y*0(1405) PI	U37S S

---

44 Y*1(1660) BRANCHING RATIOS

U44R1	Y*1(1660) INTO (KBAR N)/TOTAL					(P1)/TOTAL		
U44R1		0.05	OR LESS	ALVAREZ	63 HBC	+		
U44R1		0.16	OR MORE	BASTIEN 2	63 HBC	0		
U44R1		0.2	OR LESS	LONDON	66 HBC	+		7/66
U44R2	Y*1(1660) INTO (LAMBDA PI)/TOTAL					(P2)/TOTAL		
U44R2		0.32		ALVAREZ	63 HBC	+		
U44R2		0.09	OR LESS	BASTIEN 2	63 HBC	C		
U44R2		0.2	OR LESS	LONDON	66 HBC	+		7/66
U44R2		0.06	0.06	SMART	66 DBC	-	ASSUMING R1=0.15	7/66
U44R3	Y*1(1660) INTO (SIGMA PI)/TOTAL					(P3)/TOTAL		
U44R3		0.27		ALVAREZ	63 HBC	+		
U44R3		0.22	0.06	BASTIEN 2	63 HBC	0		
U44R3		0.25	0.15	LONDON	66 HBC	+		7/66
U44R4	Y*1(1660) INTO (LAMBDA PI PI)/TOTAL					(P4)/TOTAL		
U44R4		0.18		ALVAREZ	63 HBC	+		
U44R4		0.16	0.05	BASTIEN 2	63 HBC	0		
U44R4		0.2	OR LESS	LONDON	66 HBC	+		7/66
U44R5	Y*1(1660) INTO (SIGMA PI PI)/TOTAL					(P5)/TOTAL		
U44R5		0.18		ALVAREZ	63 HBC	+		
U44R5		0.25	0.06	BASTIEN 2	63 HBC	C		
U44R6	Y*1(1660) INTO (Y*0(1405) PI)/TOTAL					(P7)/TOTAL		
U44R6		0.75	0.25	LONDON	66 HBC	+		7/66
U44R7	Y*1(1660) INTO (KBAR N)/(LAMBDA PI)					(P1)/(P2)		
U44R7		0.43	OR MORE	SMITH	63 HBC			
U44R8	Y*1(1660) INTO (SIGMA PI)/(LAMBDA PI)					(P3)/(P2)		
U44R8		0.86		SMITH	63 HBC			
U44R8		6.8	3.0	HUWE	64 HBC	+		
U44R9	Y*1(1660) INTO (LAMBDA PI PI)/(LAMBDA PI)					(P4)/(P2)		
U44R9		0.14		SMITH	63 HBC			
U44R10	Y*1(1660) INTO (Y*0(1405) PI)/(SIGMA PI PI)					(P7)/(P5)		
U44R10		0.90	0.10 0.16	EBERHARD	65			7/66
U44R11	Y*1(1660) INTO (Y*0(1405) PI)/(Y*1(1385) PI)					(P7)/(P6)		
U44R11		0.8	OR MORE	EBERHARD	65			7/66

REFERENCES ON BARYON RESONANCES

AUTHOR YR JOURNAL VOL. PAGE AUTHORS // LABORATORIES CODE

Y*0 (1405)

37 Y*0(1405, JP=1/2-) I=0

ALSTON	61	PRL 6 698	+ALVAREZ,EBERHARD,GOOD,GRAZIANO, +	//LRL I U37
ALEXANDE	62	PRL 8 447	ALEXANDER,KALBFLEISCH,MILLER,SMITH	//LRL I U37
ALSTON	62	CERN CONF 311	+ALVAREZ,FERRO-LUZZI,ROSENFELD, +	//LRL I U37
MUSGRAVE	65	NC 35 735	+PETRZEJAS, + //BRPGM,CERN,EP,IPPCCL,SACLAY	U37
ENGLER	65	PRL 15 224	+FISK,KRAEMER,METZGER,WESTGARD,+//CRNG,BNL IJ	U37
KIM	65	PRL 14 29	J K KIM //CCLUMBIA	IJP U37
SAMITT	65	PR 139 B716	+DAY,GLASSER,SEEMAN,FRIEDMAN, + //MC,LRL	IJP U37
KITTEL	66	PL 21 349	W KITTEL, G OTTER, I WACEK //VIENNA	IJP U37

PAPER NOT REFERRED TO IN DATA CARDS.

ABRAMS	65	PR 139 B454	G S ABRAMS, B SECHI-ZORN //MC	IJP U37

Y*0 (1520)

38 Y*0(1520, JP=3/2-) I=0

WATSON	63	PR 131 2248	M B WATSON, M FERRO-LUZZI, R D TRIPP //LRL	IJP U38
GALTIERI	63	PL 6 256	A BARBARO-GALTIERI,A HUSSAIN,RC TRIPP//LRL	U38
ALMEIDA	64	PL 9 204	S P ALMEIDA, G R LYNCH //CERN	U38
MUSGRAVE	65	NC 35 735	+PETRZEJAS,+//BRPGM,CERN,EP,IPPCCL,SACLAY	U38
ARMENTER	65	PL 19 338	ARMENTEROS, + //CERN,HEIDELBERG,SACLAY	IJP U38

Y*0 (1670)

40 Y*0(1670, JP=1/2-) I=0

YUNG-CHA	64	CUBNA CONF I 615	YUNG-CHANG, IN, KLADNITSKAYA, + //CUBNA I	U40
BERLEY	65	PRL 15 641	+CONNOLLY,HART,RAHP,STONEHILL, + //BNL	IJP U40

Y*0 (1815)

39 Y*0(1815, JP=5/2+) I=0

GALTIERI	63	PL 6 256	A BARBARO-GALTIERI,A HUSSAIN,RC TRIPP//LRL	IJ U39
BIRGE	65	ATHENS CONF 296	+ELY,KALPUS,KERNAN,LOUIE,SAMOURIA, + //LRL	IJP U39
TRIPP	66	64(REV) VARENNA	R D TRIPP //REVIEW OF CERN DATA	IJP U39

PAPERS NOT REFERRED TO IN DATA CARDS.

CHAMBERL	62	PR 125 1656	CHAMBERLAIN,CROWE,KEEFE,KERTH, + //LRL I	U39
SOECKSO	64	PR 133 B757	SOECKSON,PANELLI,FRISCH,WAHLIG//PITT(BNL) J	U39
MOLLEY	65	UCRL-16274 THESIS	M R MOLLEY //LRL J	U39

Y*0 (2110)

41 Y*0(2110, JP=7/2-) I=0

BOCK	65	PL 17 166	+COCCONI,FRENCH,KINSEY, + //CERN,SACLAY	U41
COOL	66	PRL 16 1228	+GIACCHELLI,KYCIA,LEONTIC,LI,LUNDBY,+//BNL I	U41
WOHL	66	PRL 17 107	C G WOHL, F T SOLMITZ, P L STEVENSON //LRL	IJP U41

Y*0 (2340)

42 Y*0(2340, JP=) I=0

COOL	66	PRL 16 1228	+GIACCHELLI,KYCIA,LEONTIC,LI,LUNDBY,+//BNL I	U42

Y*1 (1385)

43 Y*1(1385, JP=3/2+) I=1

ALSTON	60	PRL 5 520	+ALVAREZ,EBERHARD,GOOD,GRAZIANO, + //LRL I	U43
DAHL	61	PRL 6 142	+FOWLITZ,MILLER,MURRAY,WHITE //LRL	U43
MARTIN	61	PRL 6 283	+LEITNER,CHINOWSKY,SWIVELY, + //BNL,YALE	U43
BERGE	61	PRL 6 557	+BASTIEN,DAHL,FERRO-LUZZI,KIRZ, + //LRL	U43
BASTIEN	61	PRL 6 702	P BASTIEN,M FERRO-LUZZI,A H ROSENFELD//LRL	U43
ELY	61	PRL 7 461	+FLINE,GIDAL,FAN,FOWELL,WHITE //LRL J	U43
ALSTON	62	CERN CONF 311	+ALVAREZ,FERRO-LUZZI,ROSENFELD, + //LRL	U43
COLLEY	62	PR 128 1931	+GELFAND,MAUENBERG, + //CCLUMBIA,RUTGERS JP	U43
CURTIS	63	PR 132 1771	+COFFIN,MEYER,TERWILLIGER //MICH J	U43
FOELSCHE	64	CUBNA CONF	+LOPEZ-CEPERO, + //BNL	U43
COCPER	64	PL 8 365	+FILTUTH,FRIEDAN,MALAPUE, + //CERN,APSTB	U43
HUWE	64	UCRL-11291 THESIS	D C HUWE //LRL JP	U43
MUSGRAVE	65	NC 35 735	+PETRZEJAS, + //BRPGM,CERN,EP,IPPCCL,SACLAY	U43
ARMENTER	65	PL 19 75	ARMENTEROS, + //CERN,HEIDELSACLAY	U43
BALTAY	65	PR 140.B1027	+SANDWEISS,TAFT,CULWICK,KOPP, + //YALE,BNL	U43
LONDON	66	PR 143 1034	+RAL,SAMICS,SAMARCTC,GOLDBERG,+ //BNL,SYCR J	U43

QUANTUM NUMBER DETERMINATIONS NOT REFERRED TO IN DATA CARDS.

SHAFER	63	PRL 10 179	J B SHAFER, J J MURRAY, C C HUWE //LRL	JP U43
SHAFER	64	PR 134 B1372	J B SHAFER, C C HUWE //LRL	JP U43
PALAMUD	64	PL 10 145	E PALAMUD, P E SCHLEIN //CERN,UCLA	JP U43

Y*1 (1660)

44 Y*1(1660, JP=3/2) I=1

ALEXANDE	62	CERN CONF 336	ALEXANDER,JACOBS,KALBFLEISCH,MILLER,+//LRL I	U44
ALVAREZ	63	PRL 10 184	+ALSTON,FERRO-LUZZI,HUWE, + //LRL I	U44
BASTIEN2	63	UCRL-10179 THESIS	P L BASTIEN //LRL IJ	U44
SMITH	63	ATHENS CONF 67	G A SMITH //LRL	U44
HUWE	64	UCRL-11291 THESIS	D C HUWE //LRL	U44
BERLEY	64	CUBNA CONF I 565	+CONNOLLY,HART,RAUP,STONEHILL, + //BNL IJP	U44
EBERHARD	65	PRL 14 466	+SWIVELY,ROSS,SIEGAL,FICENEC, + //LRL,ILL I	U44
LEVEQUE	65	PL 18 65	+ //SACLAY,EP,GLASGOW,IPPCCL,CXF,RHEE JP	U44
LONDON	66	PR 143 1034	+RAL,SAMICS,SAMARCTC,GOLDBERG,+ //BNL,SYCR IJ	U44
SMART	66	PRL (SUBMITTED)	W M SMART,A KERNAN,G E KALPUS,R P ELY//LRL IJP	U44

PAPERS NOT REFERRED TO IN DATA CARDS.
(BASTIEN 1 IS REPLACED BY BASTIEN 2.)
(OTHERS ARE SPIN-PARITY DETERMINATIONS. THE PARITY DETERMINATIONS HERE AND ABOVE ARE NOT ALL IN AGREEMENT.)

BASTIEN1	63	PRL 10 188	P L BASTIEN, J P BERGE //LRL IJ	U44
T-ZADEH	63	PRL 11 470	TAHER-ZADEH,FROHSE,SCHLEIN,SLATER,+ //UCLA JP	U44
EBERHARD	65	BAPS 10 478	P EBERHARD //LRL IJP	U44
LEE	66	PRL 17 45	Y Y LEE, D C REEDER, R W HARTUNG //WISC JP	U44

DATA ON BARYON RESONANCES

CODE EVENT, QUANTITY ABOVE BACKGROUND ERROR+ ERROR- REFERENCE YR TECN SIGN COMMENTS DATE PUNCHED

$Y_1^*(1765)$

45 Y*1(1760, JP=5/2-) I=1

45 Y*1(1760) MASS (MEV)

U45M		1765.0	10.0		GALTIERI	63 OBC	0	INVM(K-P)	
U45M		1755.0	10.0		ARMENTERO	65 HBC	0	K-P TC Y*1520 PI	7/66
U45M		1760.0	10.0		BELL 1,2	66 DBC	-	K-N TC Y*1520 PI	7/66
U45M		1760.0	10.0		TRIPP	66 HBC	C	K-P EL, CH EX	7/66
U45M	*	1755.0	APPROX.		UHLIG	66 HBC	0	SEVERAL CHANNELS	7/66
U45M		1776.0	6.0		SMART	66 OBC	-	K-N TC LAM PI-	7/66

45 Y*1(1760) WIDTH (MEV)

U45W		60.0	10.0		GALTIERI	63 DBC	0	IM(K-P),K-P RVUE	
U45W		105.0	20.0		ARMENTERO	65 HBC	0	K-P TC Y*1520 PI	7/66
U45W		70.0	20.0		BELL 2	66 DBC	-	K-N TC Y*1520 PI	7/66
U45W		90.0	10.0		TRIPP	66 HBC	C	K-P EL, CH EX	7/66
U45W		129.0	16.0		SMART	66 DBC	-		7/66

45 Y*1(1760) PARTIAL DECAY MODES

U45P1	Y*1(1760) INTO KBAR N	S11S17
U45P2	Y*1(1760) INTO LAMBDA PI	S18S 9
U45P3	Y*1(1760) INTO SIGMA PI	S20S 8
U45P4	Y*1(1760) INTO Y*1(1385) PI	U43S 8
U45P5	Y*1(1760) INTO Y*0(1520) PI	U38S 8

45 Y*1(1760) BRANCHING RATIOS

J45R1	Y*1(1760) INTO (KBAR N)/TOTAL							(P1)/TOTAL	
U45R1		0.6			GALTIERI	63 HBC	0	K-P RVUE	
U45R1		0.50			TRIPP	66 HBC	C	K-P EL, CH EX	7/66
J45R2	Y*1(1760) INTO (KBAR N)/(RATES 1+2+4+5)							(P1)/(P1+P2+P4+P5)	
U45R2		0.52	0.09		UHLIG	66 HBC	C	K-P CH EX	7/66
J45R3	Y*1(1760) INTO (LAMBDA PI)/TOTAL							(P2)/TOTAL	
J45R3		0.16			TRIPP	66 HBC	0	K-P TC LAM PI	7/66
U45R3		0.14	0.02		SMART	66 DBC	-	ASSUMING R1=0.5	7/66
U45R4	Y*1(1760) INTO (LAMBDA PI)/(RATES 1+2+4+5)							(P2)/(P1+P2+P4+P5)	
J45R4		0.17	0.02		UHLIG	66 HBC	0	K-P TC LAM PI	7/66
J45R5	Y*1(1760) INTO (SIGMA PI)/TOTAL							(P3)/TOTAL	
J45R5		0.03	OR LESS		TRIPP	66 HBC	0	K-P TO SIGMA PI	7/66
J45R6	Y*1(1760) INTO (SIGMA PI)/(RATES 1+2+4+5)							(P3)/(P1+P2+P4+P5)	
U45R6		0.16	OR LESS		UHLIG	66 HBC	0	K-P TC SIGMA PI	7/66
J45R7	Y*1(1760) INTO (Y*1(1385)+PI)/TOTAL							(P4)/TOTAL	
U45R7		0.10			TRIPP	66 HBC	C	K-P TO Y*1385 PI	7/66
J45R8	Y*1(1760) INTO (Y*1(1385)+PI)/(RATES 1+2+4+5)							(P4)/(P1+P2+P4+P5)	
J45R8		0.13	0.05		UHLIG	66 HBC	0	K-P TC Y*1385 PI	7/66
J45R9	Y*1(1760) INTO (Y*0(1520)+PI)/TOTAL							(P5)/TOTAL	
J45R9		0.15	0.03		ARMENTERO	65 HBC		K-P TC Y*1520 PI	7/66
J45R10	Y*1(1760) INTO (Y*0(1520)+PI)/(RATES 1+2+4+5)							(P5)/(P1+P2+P4+P5)	
J45R10		0.17	0.02		UHLIG	66 HBC	0	K-P TC Y*1520 PI	7/66

$Y_1^*(1915)$

46 Y*1(1915, JP=) I=1

46 Y*1(1915) MASS (MEV)

U46M	*	1942.0	9.0		BOCK	65 HBC		PBAR P TO YBAR Y	
U46M		1915.0	20.0		COOL	66 CNTR		K-P, D TOTAL	7/66

46 Y*1(1915) WIDTH (MEV)

U46W	*	36.0	20.0	36.0	BOCK	65 HBC			
U46W		65.0			COOL	66 CNTR			7/66

46 Y*1(1915) PARTIAL DECAY MODES

U46P1	Y*1(1915) INTO KBAR N	S11S17
U46P2	Y*1(1915) INTO LAMBDA PI	S18S 8
J46P3	Y*1(1915) INTO KBAR N PI	S11S17S 8

46 Y*1(1915) BRANCHING RATIOS

J46R1	Y*1(1915) INTO (KBAR N)/TOTAL							(P1)/TOTAL	
U46R1		0.105			COOL*	66 CNTR		ASSUMING J=5/2	7/66
U46R2	Y*1(1915) INTO (LAMBDA PI)/TOTAL							(P2)/TOTAL	
J46R2		0.12	0.08		SMART	66 DBC	-	ASSUMING R1=0.10	7/66

$Y_1^*(2035)$

47 Y*1(2035, JP=7/2+) I=1

47 Y*1(2035) MASS (MEV)

U47M	*	2022.0	20.0		BLANPIED	65 CNTR	C	GAMMA P TO K+ Y*	
U47M		2040.0	20.0		COOL	66 CNTR	C	K-P TOTAL	7/66
U47M		2030.0	20.0		WOHL	66 HBC	0	K-P TC LAM PIO	7/66

47 Y*1(2035) WIDTH (MEV)

U47W	*	120.0	20.0		BLANPIED	65 CNTR	0	GAMMA P TO K+ Y*	
U47W		150.0			COOL	66 CNTR	C	K-P TOTAL	7/66
U47W		170.0			WOHL	66 HBC	C	K-P TC LAM PIO	7/66

47 Y*1(2035) PARTIAL DECAY MODES

U47P1	Y*1(2035) INTO KBAR N	S11S17
U47P2	Y*1(2035) INTO LAMBDA PI	S18S 9
J47P3	Y*1(2035) INTO SIGMA PI	S20S 8

47 Y*1(2035) BRANCHING RATIOS

U47R1	Y*1(2035) INTO (KBAR N)/TOTAL							(P1)/TOTAL	
U47R1		0.155			COOL	66 CNTR	C	K-P TOTAL	7/66
U47R1		0.25			WOHL	66 HBC	C	K-P CH EX	7/66
U47R2	Y*1(2035) INTO (LAMBDA PI)/TOTAL							(P2)/TOTAL	
U47R2		0.16			WOHL	66 HBC	C	ASSUMING R1=0.25	7/66

$Y_1^*(2260)$

48 Y*1(2260, JP=) I=1
EVIDENCE GOOD BUT NOT OVERWHELMING.
OMITTED FROM TABLE.

48 Y*1(2260) MASS (MEV)

U48M	*	2245.0			BLANPIED	65 CNTR		GAMMA P TC K+ Y*	
U48M	*	2299.0	6.0		BOCK	65 HBC		PBAR P TO YBAR Y	
U48M		2260.0	20.0		COOL	66 CNTR		K-P, D TOTAL	7/66

48 Y*1(2260) WIDTH (MEV)

U48W	*	150.0			BLANPIED	65 CNTR			
U48W	*	21.0	17.0	21.0	BOCK	65 HBC			
U48W		180.0			COOL	66 CNTR			7/66

48 Y*1(2260) PARTIAL DECAY MODES

U48P1	Y*1(2260) INTO KBAR N	S11S17
U48P1	Y*1(2260) INTO KBAR N PI	S11S17S 8

48 Y*1(2260) BRANCHING RATIOS

U48R1	Y*1(2260) INTO (KBAR N)/TOTAL							(P1)/TOTAL	
J48R1		0.14			COOL	66 CNTR		ASSUMING J=9/2	7/66

$\Xi^*(1530)$

49 XI*1/2(1530, JP=3/2+) I=1/2

49 XI*1/2(1530) MASS (MEV)
(* ONLY UNSTARRED DATA -- CAREFUL ATTEMPTS TO OBTAIN SEPARATE CHARGE-STATE PASSES -- ARE USED.)

U49M	*	1529.0	5.0		PJERROU	62 HBC	C-		
U49M	*	1532.0	2.0		BADIER	64 HBC	0-		
J49M-		1535.7	3.2		LONDON	66 HBC	-		7/66
U49M0		1528.7	1.1		LONDON	66 HBC	C		7/66

49 XI*(-)-XI*(0) MASS DIFFERENCE (MEV)

U49D		4.5	2.3		PJERROU	62 HBC	C-		7/66
U49D		7.0	4.0		LONDON	66 HBC	0-	SEE MASS CARDS	7/66
U49D		2.0	3.2		MERRILL	66 HBC	0-		7/66

49 XI*1/2(153C) WIDTH (MEV)

U49W		7.0	2.0		SCHLEIN	63 HBC	0		
U49W		8.5	3.5		LONDON	66 HBC	0		7/66
U49W		7.0	7.0		BERGE	66 HBC	C		7/66

49 XI*1/2(1530) PARTIAL DECAY MODES

U49P1	XI*1/2(1530) INTO XI PI	S22S 8

$\Xi^*(1705)$

51 XI*1/2(1705, JP=) I=1/2
EVIDENCE NOT COMPELLING. OMITTED FROM TABLE.

51 XI*1/2(1705) MASS (MEV)

J51M		1705.0	APPROX		SMITH	65 HBC	0-	INVM(XIPI,LAMK)	

51 XI*1/2(1705) WIDTH (MEV)

J51W		20.0	APPROX		SMITH	65 HBC	0-	INVM(XIPI,LAMK)	

51 XI*1/2(1705) PARTIAL DECAY MODES

J51P1	XI*1/2(1705) INTO XI PI	S22S 8
U51P2	XI*1/2(1705) INTO LAMBDA KBAR	S18S11

$\Xi^*(1820)$

50 XI*1/2(1820, JP=) I=1/2

50 XI*1/2(1820) MASS (MEV)

U50M	*	1770.0			HALSTEINS	63 FBC	0-	INVM(XI- PI+,0)	
J50M		1817.0	7.0		SMITH 1	65 HBC	0-	INVM(LAM K-,0)	
U50M		1814.0	4.0		BADIER	65 HBC	C	INVM(LAM K0)	

50 XI*1/2(1820) WIDTH (MEV)

U50W	*	80.0	OR LESS		HALSTEINS	63 FBC	0-	INVM(XI- PI+,0)	
U50W		12.0	4.0		BADIER	65 HBC	C	INVM(LAM K0)	
U50W		30.0	7.0		SMITH 2	65 HBC	C-	INVM(LAM K-,0)	

50 XI*1/2(1820) PARTIAL DECAY MODES

U50P1	XI*1/2(1820) INTO LAMBDA KBAR	S18S11
J50P2	XI*(1820) INTO XI PI	S22S 8
U50P3	XI*(1820) INTO XI*1/2(1530) PI	U49S 8
U50P4	XI*(1820) INTO XI PI PI (XI PI NOT XI*(153C))	S22S 8S 8

50 XI*1/2(182C) BRANCHING RATIOS

U50R1	XI*1/2(1820) INTO (LAMBDA KBAR)/TOTAL							(P1)/TOTAL	
U50R1	*	LARGE			BADIER	65 HBC			7/66
J50R1	*	LARGE			SMITH 2	65 HBC			7/66
U50R2	XI*1/2(1820) INTO (XI PI)/(LAMBDA KBAR)							(P2)/(P1)	
J50R2		0.20	0.20		BADIER	65 HBC			7/66
U50R2	*	SMALL			SMITH 2	65 HBC		IF XI*1933 EXIST	7/66
U50R3	XI*1/2(1820) INTO (XI*(1530) PI)/(LAM KBAR)							(P3)/(P1)	
U50R3		0.26	0.13		SMITH 1	65 HBC			
U50R3	*	SMALL			BADIER	65 HBC			7/66
U50R4	XI*1/2(1820) INTO (XI PI PI)/(LAMBDA KBAR)							(P4)/(P1)	
U50R4		0.1	OR MORE		SMITH 1	65 HBC			
U50R4	*	SMALL			BADIER	65 HBC			7/66

$\Xi^*(1933)$

52 XI*1/2(1933, JP=) I=1/2

52 XI*1/2(1933) MASS (MEV)

U52M		1933.0	16.0		BADIER	65 HBC	C	INVM(XI- PI+)	

52 XI*1/2(1933) WIDTH (MEV)

U52W		140.0	35.0		BADIER	65 HBC	C	INVM(XI- PI+)	

52 XI*1/2(1933) PARTIAL DECAY MODES

U52P1	XI*1/2(1933) INTO XI PI	S22S 8
U52P2	XI*1/2(1933) INTO LAMBDA KBAR	S18S11

REFERENCES ON BARYON RESONANCES

AUTHOR	YR JOURNAL VOL. PAGE	AUTHORS // LABORATORIES	CODE

$Y_1^*(1765)$

45 Y*1(1760, JP=5/2-) I=1

GALTIERI	63 PL 6 256	A BARBARO-GALTIERI,A HUSSAIN,RD TRIPP//LRL	IJ U45
ARMENTER	65 PL 15 338	ARMENTEROS, + //CERN,HEIDELBERG,SACLAY	IJP U45
BELL 1	66 PRL 16 203	R B BELL, R W BIRGE, Y-L PAN, R T PU //LRL	IJP U45
BELL 2	66 UCRL-16936 THESIS	R B BELL //LRL	IJP U45
TRIPP	66 64(REV) VARENNA	R D TRIPP //REVIEW OF CERN DATA	IJP U45
UHLIG	66 PRL (SUBMITTED)	+CHARLTON,COOCON,GLASSER,+//MARYLAND,USNRL	IJ U45
SMART	66 PRL (SUBMITTED)	W R SMART,A KERMAN,G E KALMUS,R P ELY//LRL	IJP U45

PAPERS NOT REFERRED TO IN DATA CARDS.
(PRECURSORS OF UHLIG 66 ARE BELL 66 RESPECTIVELY.)

YOOH	65 ATHENS CONF 269	G B YOOH //MARYLAND	IJ U45
BIRGE	65 ATHENS CONF 256	+ELY,KALMUS,KERMAN,LOUIE,SAKOVICH, + //LRL	IJP U45

$Y_1^*(1915)$

46 Y*1(1915, JP=) I=1

BOCK	65 PL 17 166	+COOPER,FRENCH,KIRSCH, + //CERN,SACLAY	I U46
COOL	66 PRL 16 1228	+GIACOMELLI,KYCIA,LEONTIC,LI,LUNDBY,+//BNL	I U46
SMART	66 PRL (SUBMITTED)	W R SMART,A KERMAN,G E KALMUS,R P ELY//LRL	IJP U46

$Y_1^*(2035)$

47 Y*1(2035, JP=7/2+) I=1

BLANPIED	65 PRL 14 741	+GREENBERG,HUGHES,KETCHUM,LU,+//YALE(CEA)	U47
CCCL	66 PRL 16 1228	+GIACOMELLI,KYCIA,LECHTIC,LI,LUNDBY,+//BNL	I U47
WOHL	66 PRL 17 107	C G WOHL, F T SOLMITZ, R L STEVENSON //LRL	IJP U47

QUANTUM NUMBER DETERMINATION NOT REFERRED TO IN DATA CARDS.

SMART	66 PRL (SUBMITTED)	W R SMART,A KERMAN,G E KALMUS,R P ELY//LRL	IJP U47

$Y_1^*(2260)$

48 Y*1(2260, JP=) I=1

BLANPIED	65 PRL 14 741	+GREENBERG,HUGHES,KITCHING, + //YALE(CEA)	U48
BOCK	65 PL 17 166	+COOPER,FRENCH,KIRSCH, + //CERN,SACLAY	U48
COOL	66 PRL 16 1228	+GIACOMELLI,KYCIA,LEONTIC,LI,LUNDBY,+//BNL	I U48

$\Xi^*(1530)$

49 XI*1/2(1530, JP=3/2+) I=1/2

PJERROU	62 PRL 9 114	+PROWSE,SCHLEIN,SLATER,STORK,TICHO //UCLA	I U49
SCHLEIN	63 PRL 11 167	+CAMPONY,PJERROU,SLATER,STORK,TICHO //UCLA	IJP U49
BACIER	64 DUBNA I 593	+DEMCLLIN,GOLDBERG, + //EP,SACLAY,AMSTR	I U49
PJERROU	65 PRL 14 275	+SCHLEIN,SLATER,SMITH,STORK,TICHO //UCLA	U49
LONDON	66 PR 143 1034	+RAL,SAMIOS,YAMAMOTO,GOLDBERG,+ //BNL,SYCR	IJ U49
BIRGE	66 PR (ACCEPTED)	+EBERHARD,HUBBARD,PERRILL,R-SHAFER,+ //LRL	I U49
MERRILL	66 UCRL-16455 THESIS	D W MERRILL //LRL	JP U49

PAPERS NOT REFERRED TO IN DATA CARDS.
(LONDON 66 REPLACES BERTANZA 62.)
(SHAFER 66 IS A JP DETERMINATION.)

BERTANZA	62 PRL 9 180	+BRISSON,CONNOLLY,HART,MITRA,+ //BNL,SYCR	I U49
SHAFER	66 PR 142 883	BUTTON-SHAFER,LINDSEY,MURRAY,SMITH //LRL	JP U49

$\Xi^*(1705)$

51 XI*1/2(1705, JP=) I=1/2

SMITH	65 ATHENS CONF 251	G A SMITH, J S LINDSEY //LRL	I U51

$\Xi^*(1820)$

50 XI*1/2(1820, JP=) I=1/2

HALSTEEN	63 SIENA CONF 173	HALSTEENSLID,+//BERGEN,CERN,EP,RTHF,UNICOL	I U50
SMITH 1	65 PRL 14 25	+LINDSEY,BUTTON-SHAFER,MURRAY //LRL	IJP U50
BACIER	65 PL 16 171	+DEMCLLIN,GOLDBERG, + //EP,SACLAY,AMSTR	I U50
SMITH 2	65 ATHENS CONF 251	G A SMITH, J S LINDSEY //LRL	U50

$\Xi^*(1933)$

52 XI*1/2(1933, JP=) I=1/2

BACIER	65 PL 16 171	+DEMCLLIN,GOLDBERG, + //EP,SACLAY,AMST	I U52

Notes on Stable Particles (UCRL-8030, Aug. 1966)

Charged pion lifetime (Roos, April 1966)

The recent precision measurements by ECKHAUSE+ 65 and KINSEY+ 66 are in disagreement with older data and in violent disagreement with each other. As long as the reason for this situation is not understood we choose to tabulate a slight modification of the value of Eckhause+ (which is intermediate between the old value and the value of Kinsey+). The modification arises from discussions with Siegel (of Eckhause+) on the systematic error introduced by a given choice of early cutoff time, and it amounts to increasing the value of Eckhause+ by 0.01 nsec and doubling the error. (We have modified only the table, not the data card.)

Charged pion branching ratio into $\pi^0 e \nu$ (Roos, April 1966)

The Depommier+ value has not been combined with earlier values because of a systematic error, which has been taken into account by Depommier+ in their present evaluation, but which has been neglected by all groups previously (V. Soergel, private communication). This procedure may further be justified by the fact that the weighted mean (WM) of all other measurements has a larger error than the single measurement by DEPOMMIER+ 66 (D), and that the possible bias is consistent with zero, i.e.,

$$WM - D = (0.045 \pm 0.14)10^{-8}.$$

Neutral pion lifetime (Roos, April 1966)

Since the group of emulsion measurements disagree largely with the two much shorter lifetimes by VON DARDEL+ 63 and by BELLETTINI+ 65 (who used different counter techniques), we have taken this as and indication that the emulsion measurements perhaps define only an upper limit. The table lists the weighted, scaled mean of the values of VON DARDEL+ 63 and BELLETTINI+ 65.

Eta decay into neutrals (Price, Barbaro-Galtieri, Aug. 1966)

In HBC and DBC experiments reporting the mode $\eta \to 3\pi^0$, the mode $\eta \to \pi^0 2\gamma$ is also included (as well as the mode $\eta \to 2\pi^0\gamma$, if it exists). Since the detection efficiencies are different for the various modes, one may not merely substitute the combined rate $(3\pi^0 + \pi^0 2\gamma)$ for the reported $3\pi^0$ rate in these experiments. MULLER+ 63 (DBC) state that their detection efficiency per γ ray is about the same regardless of the mode of decay ($3\pi^0$ or $\pi^0 2\gamma$). CRAWFORD2 66 (HBC) has shown that the same is true for the HBC experiments listed. Thus for all these experiments (assuming $\eta \to 2\pi^0\gamma$ to be equal to zero)

$$3\pi^0_{\text{true}} = 3\pi^0_{\text{reported}} \times \frac{1}{1 + \frac{4}{6}r} \qquad (1)$$

and

$$\pi^0 2\gamma_{true} = 3\pi^0_{reported} \times \frac{r}{1+\frac{4}{6}r}, \qquad (2)$$

where

$$r = \frac{\pi^0 2\gamma}{3\pi^0}.$$

CRAWFORD2 gives values for $3\pi^0/\pi^+\pi^-\pi^0$, using (1) and assuming $r = 1.79 \pm 0.58$, from DIGIUGNO+ 66 (CNTR). In our programs we have used the formulas (1) and (2) for these experiments, with the parameter "r" determined by the overall fit. The errors of the DIGIUGNO+ 66 experiment have been increased by a factor 2 to take into account possible systematic errors, as suggested by the authors. This has been done because this experiment

(a) does not agree with GRUNHAUS 66 and WAHLIG 66, and
(b) reduces the $3\pi^0/\pi^+\pi^-\pi^0$ ratio even further below the "natural" value of 3/2.

It is hoped that this disagreement will be discussed at the August 1966 Berkeley Conference.

Lambda lifetime (Barbaro-Galtieri, Aug. 1966)

There is a large disagreement between various experiments, so a Gaussian ideogram of the decay rates would show two peaks for this distribution. We have neglected all measurements earlier than 1961. (They have relatively large errors and dilute χ^2.) For the moment, we have chosen to neglect all unpublished measurements, except for those reported in theses. We are then left with 10 determinations of the lambda lifetime.

The five hydrogen bubble chamber measurements agree with each other (no "east-west effect"). The four (HeBC, PBC or FBC) bubble chamber measurements do not agree between themselves, and the same is true for the two spark chamber measurements. At present we have no criteria to choose between the two peaks, so we quote the weighted average, with an error multiplied by the scale factor (S = 1.6). This is a temporary and surely inadequate solution.

Notes on Meson Resonances (UCRL-8030, Aug. 1966)

The κ(725) (Lynch, Rosenfeld, Aug. 1966)

We are beginning to think that κ should be classified along with flying saucers, the Loch Ness Monster, and the Abominable Snow Man. We have heard of several experiments which were supposed to confirm it, and each one has either failed completely or failed to find it in the sought-for channel and found instead a small Kπ peak near 725 MeV in some other channel.

Like flying saucers, the κ will be hard either to confirm or deny. We should collect all the data we can at the Berkeley Conference and then compile them.

We have stopped punching data cards, although, out of inertia, a few up-to-date ones have been added to the deck.

Below are some partially documented notes from our Kappa dossier.

The κ was first reported at LRL by ALEXANDER+ 62 and MILLER+ 63 in the reaction 1.5- to 2.4-GeV/c $\pi^- p \to \Sigma^- \pi^+ K^0$. As more of these events have been accumulated by the same group, the effect has diminished, and this experiment no longer has significant evidence for the κ.[1]

The second experiment to report the κ was that of WOJCICKI+ 63, who studied about 4000 events of the reaction $K^- p \to K^0 \pi^+ p$. In agreement with the original κ evidence, their κ had a mass of 723 ± 3 MeV and a width of <12 MeV. Wojcicki's largest effect was at 1.08 BeV/c. The CERN-SACLAY K^- collaboration[2] has more data than Wojcicki at this momentum, and they see a valley in the κ region, thus washing out Wojcicki's effect. They do, however, report evidence for κ when the beam is tuned below the K^* threshold.

A comparable experiment at LRL[3] at the same momenta as the CERN experiment sees no evidence for the κ either above or below the K^* threshold.

Furthermore, more than 10 000 events of the types $K^- p \to K^- p\pi^0$ and $K^- n\pi^+$ have now been examined at LRL in the same film as Wojcicki used, and no significant κ effect is observed.[4] This same reaction has been studied at LRL at higher momenta, and again in 8000 events from 2.1 to 2.7 BeV/c no κ is observed.[5]

The κ was also reported by London et al.[6] in 413 events of the reaction 2.0-GeV/c $K^- p \to \Xi\pi K$. The κ that they saw was at 730 MeV and <15 MeV wide. Recent data at UCLA[7] at a nearby momentum (2.0 rather than 2.24 GeV/c) finds no evidence in this reaction for a resonance at 725 MeV. (They do have a peak at 700 MeV, however.)

A fourth experiment to report the κ was a CERN experiment of Ferro-Luzzi et al.[8] who saw an effect in the reaction $K^+ p \to NK\pi\pi\pi$. This κ was at 725 MeV and had a width of about 40 MeV. This effect was found in the 3-BeV/c data, but was absent in the 3.5-GeV/c data. An experiment at Wisconsin[9] at 3.6 GeV/c with three times as many events as the CERN experiment also saw no evidence for a κ.

Evidence for the κ was reported by KIM 65 in the reaction $\pi^- p \to K^0 \Lambda \pi^0$. An LRL experiment[1] with more events does not see a significant peak at the κ mass.

There have also been other experiments that have looked for the κ. The CERN K^+ group[10] looked for the κ below K^* threshold in the reaction $K^+ p \to K^0 \pi^+ p$, and saw none. In the reaction $K^- p \to KN\pi\pi$, Wojcicki et al.[11] see a small κ effect at 725 MeV. Other large experiments[5, 7, 12] (all at higher momentum) see no effect at 725 MeV.

The κ seems dead; long live the κ.

---

1. Lynn Hardy (Ph. D. thesis), UCRL-16788, July 1966.
2. Riccardo Levi-Setti (Chicago), private communication.
3. George Kalmus (LRL), private communication.
4. Gerald Lynch (LRL), private communication.
5. Jeremy Friedman (LRL), private communication.
6. G. W. London et al., Phys. Rev. 143, 1034 (1966), includes the data of CONNOLLY+ 63.
7. Philip Dauber (UCLA), private communication.
8. Massimiliano Ferro-Luzzi et al., Phys. Letters 12, 255 (1964).
9. William D. Walker (reported at Athens, 1965).
10. Victor Henri (CERN), private communication.
11. Stanley G. Wojcicki et al., Phys. Rev. 135, B495 (1964).
12. Morris Pripstein (LRL), private communication.

$K\bar{K}_1 \to \eta\pi$ (Rosenfeld, Aug. 1966)

The I = 1 $\bar{K}K$ enhancement has been seen only in $\bar{p}p$ annihilations, where no $\eta\pi$ mass spectra are known to us. There are $\eta\pi$ spectra in $\pi^- p$ interactions [see Alitti et al., Phys. Letters 15, 69 (1965)], but there the total production of KK_1 is ≤ 3 μb at 3.1 GeV/c [see Richard I. Hess (Ph. D. Thesis, UCRL-16832, June 1966), submitted Aug. 1966 to Phys. Rev. Letters].

Notes on Baryon Resonances (UCRL-8030, Aug. 1966)

Mass and width assignments for the lowest eight N^*'s (Rosenfeld, Aug. 66)

The M and Γ values were assigned by inspection of the Argand diagrams of BAREYRE+ 65, as drawn in the attached Fig. 1. We chose the solutions of Bareyre et al. merely because they gave complete sets of phase shifts for all eight probable resonances. Other analyses do not necessarily agree, and in fact the S-wave amplitudes may not resonate at all!

We looked at Fig. 1 and tried to choose a value of M for which the amplitude was changing fast and seemed to be half-way around a roughly circular trajectory. We chose $\Gamma/2$ at a place where the "velocity" seems to have dropped to 1/2.

The basis for this criterion is the following: If the trajectory is simply the pure Breit-Wigner resonant circle,

$$T = \frac{1}{\epsilon - i}, \tag{1}$$

where $\epsilon = (M-E)/(\Gamma/2)$, it is simple to show that its "velocity" is

$$\left|\frac{d\vec{T}}{d\epsilon}\right| = \frac{1}{1+\epsilon^2} = \mathrm{Im}\,(T), \tag{2}$$

and so should be a maximum at the top, and should fall to 1/2 by one half-width away from resonance. A fair example of (2) is the $\Delta(1236, P_{33})$ trajectory, which seems to behave as predicted up to about 1260 MeV.

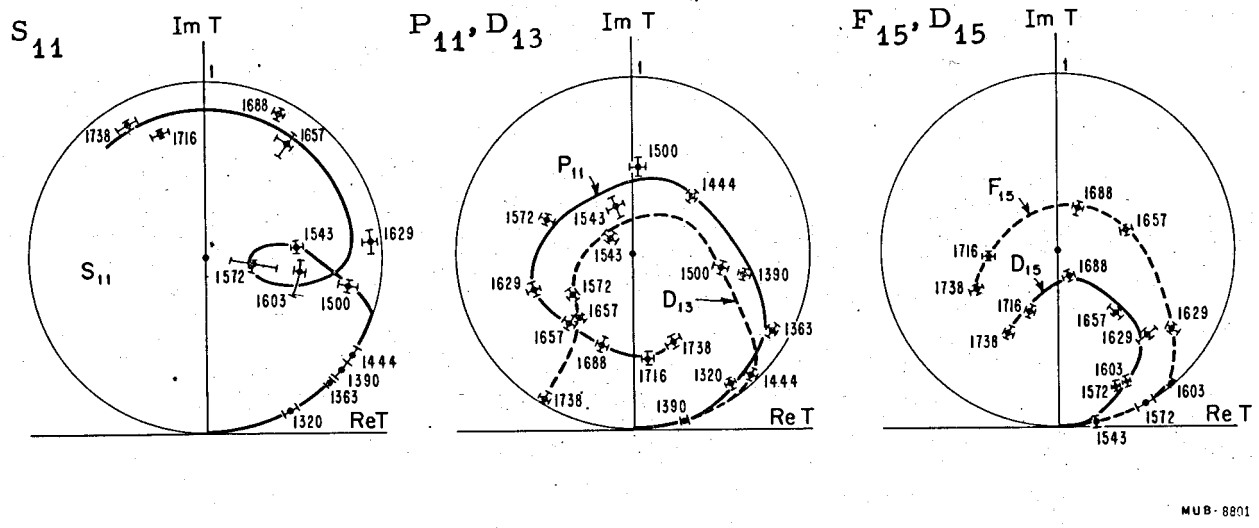
In general a resonance will be superimposed on a "slowly varying" background amplitude b, and will have the form

$$T = b + \frac{x\, e^{2i\delta_b}}{\epsilon - i}, \tag{1'}$$

where $x \leq 1$ is the elasticity, and $e^{2i\delta_b}$ is the result of background, and rotates the resonant circle so as to keep it within the unitarity circle. Despite these complications, the velocity equation (2) will still be

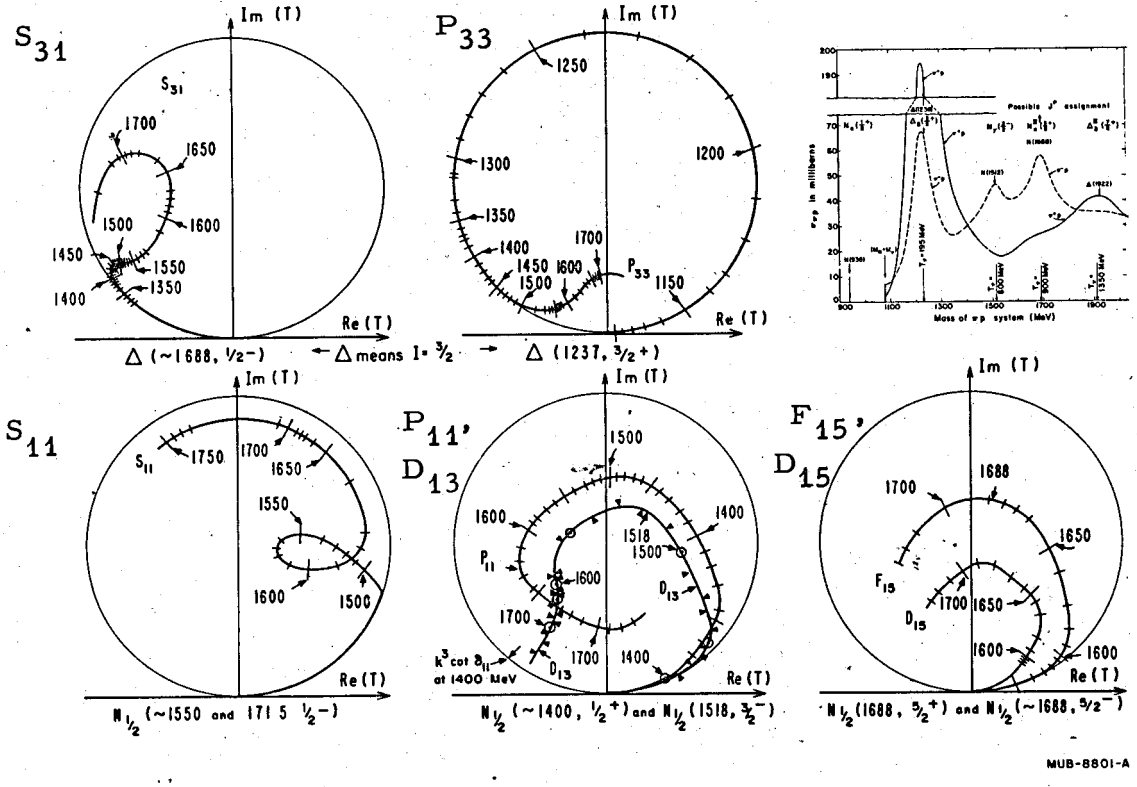
$$\left|\frac{d\vec{T}}{d\epsilon}\right| = \frac{x}{1+\epsilon^2}. \tag{2'}$$

Hence the maximum velocity seems to be a simple local criterion for choosing the mass of a resonance; for a single Breit-Wigner resonance it is actually correct, for two adjacent coupled resonances it is not correct (in fact inspection of Fig. 1 shows an indeterminancy of $\approx$100 MeV in several cases), but it is still a useful extra criterion to weigh into the choice, and has the advantage that one can read off an arbitrary answer without understanding the assumptions that go into a complicated fit.



MUB-8801

Solutions of Bareyre et al. to I-spin 1/2 resonant partial waves. The crosses show the amplitudes and errors computed from the data at various energies. The smooth connecting lines are guesses.



MUB-8801-A

The smooth guessed curves above are replotted with the actual calculated amplitudes replaced by hatch marks interpolated every 10 MeV. For a resonance they should be spaced proportionally to $\mathrm{Im}(T) = (1 + \epsilon^2)^{-1}$. The I-spin 3/2 resonant partial waves have been added at the top, along with a summary of the total cross section for $\pi^+ p$ and $\pi^- p$.

MUB-8801-A

Fig. 1

In order to help other readers make such visual fits, we should be happy to include in UCRL-8030 figures similar to the cross-hatched part of Fig. 1, if other authors would supply them.

We shall now consider each of the first eight resonances in turn. For a more detailed discussion see R. D. Tripp, Proc. 1966 Varenna Summer School, Course 33 (Academic Press, 1966), or A. H. Rosenfeld, UCRL-16968,

N(1400, $1/2^+ = P_{11}$).

The P_{11} amplitude starts off negative (repulsive force), then turns around and crosses the origin at a mass 1175 MeV. It seems to reach a maximum velocity even below 1400 MeV. Let us consider the P_{11} amplitude to be the result of two opposite forces, a repulsive force responsible for a negative scattering length A, and an attractive resonant interaction. The scattering length will produce a phase shift $2i\delta'$ and a contribution to the T' matrix

$$T' = \frac{e^{2i\delta'} - 1}{2i} \tag{3}$$

The resonant term T will be given by (2), so that the total amplitude, $T'' = T' + T$, will now start out negative, and then superimposed on this clockwise motion will be the counterclockwise circular resonant behavior.

How far around this resonant circle is 1400 MeV? To solve this simple problem, assume that the repulsive phase shift $2\delta'$ is related to a scattering length by

$$k^3 \cot \delta' = 1/A,$$

or more precisely, using McKinley's phase shifts,[1]

$$(k/m_\pi)^3 \cot \delta' = -(.015)^{-1}.$$

Then, at 1400 MeV, δ' has reached -15 deg. We have plotted the corresponding point on Fig. 1. It is encouraging that this point lies almost diametrically across the resonant circle from 1400 MeV. Evidence for this excited nucleon at about 1400 MeV was seen in pp diffraction scattering in 1964 by Cocconi et al.[2] and more recently by Anderson et al.[3]

Note that the velocity seems to increase again at ≈1650 MeV. However, the solution by Brandsen et al.[4] shows no such second maximum, and anyway 1650 seems too far away ($2.5 \times \Gamma/2$) to influence our assignment of M ≈ 1400 MeV.

$N^*_{1/2}(1550,\ 1/2^- = S_{11})$, and $(1700,\ 1/2^- = S_{11})$

The Bareyre+ trajectory indicates two resonances. It first goes around a small circle centered around ≈ 1570 MeV, and then follows a larger circle with M≈ 1700. The crosshatching on the smaller circle actually shows two velocity maxima, which we take to indicate inadequate input data. Hence our local criterion of maximum velocity fails. To fit the larger picture we have used the result of MICHAEL 66, who has "fitted" (visually!) the solution of Bareyre et al. to two resonant circles plus no background.

$N^*(1518,\ 5/2^-,\ D_{13})$

In the good old days the 600-MeV bump was thought to be a single $3/2^-$ resonance of mass 1518 MeV. This old value still seems reasonable, and we continue to use it.

$N^*(1688,\ 5/2^-,\ D_{15})$ and $N^*(1688,\ 5/2^+,\ F_{15})$

The old nominal value of 1688 corresponds to the peak of the "900-MeV bump." Although assigned before it was known that the bump seems to cover three resonances, the value 1688 still seems reasonable for D_{15} and F_{15}. We have discussed S_{11} above.

1. J. M. McKinley, Rev. Mod. Phys. 35, 788 (1963).
2. G. Cocconi, E. Lillethun, J. P. Scanlon, C. A. Stahlbrandt, C. C. Ting, J. Walter, and A. M. Wetherell, Phys. Letters 8, 137 (1964).
3. E. W. Anderson, E. J. Bleser, G. B. Collins, T. Fujii, J. Menes, F. Turkot, R. A. Carrigan, Jr., R. M. Edelstein, N. C. Hien, J. McMahon, I. Nadelhaft, Phys. Rev. Letters 16, 855 (1966).
4. B. H. Brandsen, P. J. O'Donnell, Physics Letters 19, 420 (1965).