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СООБЩЕНИЯ ОБЪЕДИНЕННОГО ИНСТИТУТА ЯДЕРНЫХ ИССЛЕДОВАНИЙ ДУБНА

G.T.Adylov, F.K.Aliev, W.Gajewski, I.X.Ion, B.A.Kulakov, B.Niczyporuk, T.S.Nigmanov, E.N.Tsyganov, K.Wala E.Dally, , D.Drickey, A.Liberman, P.Shepard, J.Tompkins

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REAL-TIME ON-LINE PROGRAMS FOR THE 77 -p ELASTIC SCATTERING EXPERIMENT USING AN HP 2116B COMPUTER



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ЛАБОРАТОРИЯ ВЫСОНИХ ЭНЕРГИЙ

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REAL-TIME ON-LINE PROGRAMS FOR THE π -p ELASTIC SCATTERING EXPERIMENT USING AN HP 2116B COMPUTER

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Математическое обеспечение *т-р* эксперимента в реальном масштабе времени на базе вычислительной машины

Дано описание программ контроля экспериментальной аппаратуры и простейшего геометрического восстановления актов рассеяния первичной частицы в реальном масштабе времени эксперимента по упругому *п-р* рассеянию, выполненной на ЭВМ 2116В.

Сообщение Объединенного института ядерных исследований Дубна, 1973

Adylov G.T., Aliev F.K., Gajewski W. et al. E1 - 6909

Real-Time On-Line Programs for the *m-p* Elastic Scattering Experiment Using an HP 2116B Computer

On-line programs are described which control an experimental setup and analyse events by geometrical and kinematic criteria at the real time of the π -p elastic scattering experiment using an HP 2116B computer.

Communications of the Joint Institute for Nuclear Research. Dubna, 1973 The present software is taken mostly from the software of the pi-e scattering experiment $^{/1,3/}$. The present experimental setup is described in ref. $^{/2/}$. The program HSTAC and the subroutine PAIR (controlling program TRFIT) have been changed, these changes are described in this part of our paper.

A statement water and statements

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I. Programs

The subroutine PAIR is scheduled by the program TRFIT. All other subroutines, except PAIR, controlled by TRFIT are not changed. PAIR analysed the events with one track in each block of the chamber only. The scattering angle of the primary particle, the Z coordinate of the scattering position along the beam, the scattered particle momentum, etc., were determined. For the scattering angle (of order of 10^{-3} radians) we used the formula

 $\theta = \sqrt{\theta_x^2 + \theta_y^2}$ where θ_x and θ_y are the projections of the scattering angle in XOZ and YOZ views, respectively, θ is the scattering angle of the primary particle. In the view the scattered angle had the largest value, the Z coordinate of the scattering point was determined by

 $Z = (A_1 - A_2) / (B_2 - B_1),$

where A is the intercept and B is the slope parameter of the tracks in the first and second blocks of the chambers.

3

The calculation of the Z^1 coordinate was made only for those cases where the scattered angle exceeded the limiting value $\theta > 1$ mrad.

The momentum of the scattered particles was defined by the formula

 $p = \frac{H}{X_3 - X_2},$

where *H* is the appropriate constant for our analyzing magnet, (SP-12 with a field of 17 kilogauss); X_3 and X_2 are the slope parameters of the tracks, in the third and second blocks of the chambers, respectively.

The subroutine PAIR also calculated the values:

$$X_{23} = X_{3} - X_{2}$$

$$Y_{23} = Y_{3}' - Y_{2}'$$

$$Y_{23} = Y_{3} - Y_{2}$$

(the differences of the intercept and slope parameters - A and - B in adjacent blocks of chambers) which characterized the constants of the chamber system as well as other apparatus parameters.

The program HSTAC was changed to accumulate the histograms of results calculated by PAIR. In addition, there were some changes in the accumulation of the histograms from the ADC's which contained the value that characterized the particle scattering angle for this experiment.

II. Computer Output

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103 S	econdary pa	u ucies (and the second
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	cattered and	gle(θ)	of the prin	nary partici	е.
104 I	listogram o	f the va	lue $X_2' - X$	i at the	center of
t t	he target.	and the second sec		The Carlo	
105	· · · · · ·	X	$_{2} - X_{I}$	**	* 7
106	***	Y.	-Y.	22	· · ·
107	"	Ŷ	- Y .	"	"
108-111	Distribution	of the va	lues X3 -	$-X'_{2},X'_{3} - X$	2 .

References

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