

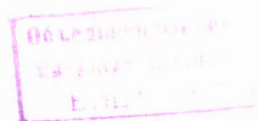
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STAR-DETECTOR FOR π^- MESONS

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In contrast to many other particles π^- mesons at their stop effectively produce stars with large energy release. This phenomena has been used by us for selected detecting of π^- mesons. The star-detector of π^- mesons represents a telescope of two scintillation counters set in coincidence. The first counter is an ordinary counter with 100 % efficiency for passing particles. The second counter of the star-detector works at comparatively low supply voltage. Hence it detects the large light impulses only, produced in the scintillator as the result of π^- stars. Its efficiency for the detecting of passing particles is very low. The photomultiplier of the second counter works as spectrometric one with highly stabilized voltage supply. Using this detector one may quickly (in 15 minutes, the π^- beam intensity is 10^3 per sec.) measure the range and energy of π^- mesons. The typical range curve for 160 MeV π^- mesons is shown on fig.I. It may be seen from this figure that the star-detector detects the stars only, but not the stops of particles; that is, it has the selected sensitiveness to π^- mesons. Really, if the star-detector should detect the stops of particles, it should be equally sensitive to any heavy particle. In this case the measured range curve in the region of large range should look like the dotted line on fig.I. which corresponds to μ^- mesons contaminating (10%) the π^- beam. The measured range curve does not show any peak in this region. It may be concluded from the figure, that the star-detector sensitiveness to π^- mesons is at least 20 times larger than that to μ^- mesons.

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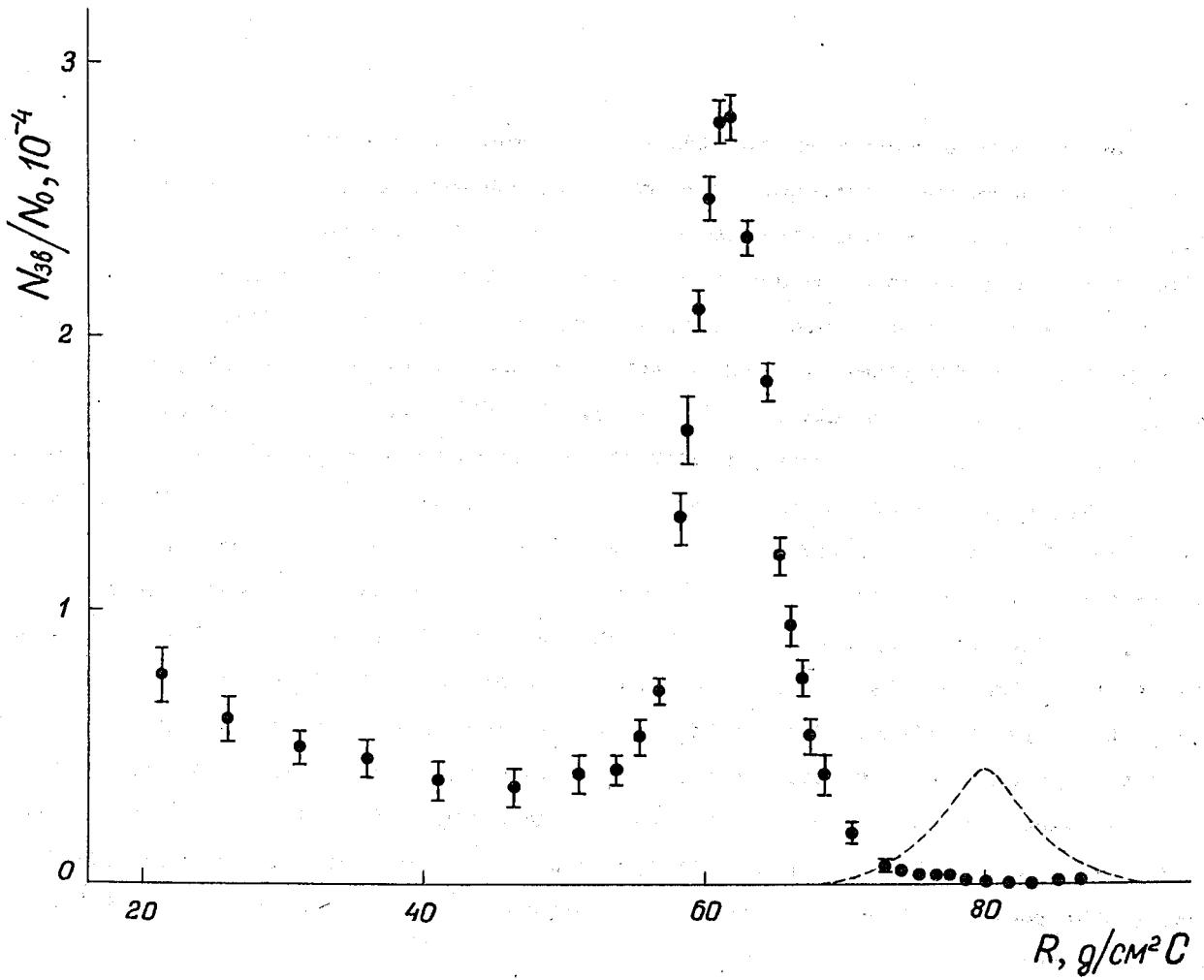


Fig. 1. Range curve for 160 MeV π^- mesons in carbon, measured with the star-detector. N_{36} - the counting rate of the star-detector, N_0 - the intensity of the π^- beam.