

PROPOSAL

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PROTON-NUCLEUS INTERACTIONS AT TEVATRON ENERGY

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ABSTRACT

Proton-nucleus interactions at Tevatron highest energy are studied by using the different target nuclei (aluminum, copper, tin and tungsten).

PURPOSE OF EXPERIMENT

Particle production mechanism in pA collision can be studied through target mass dependence on angular distribution of secondary charged particle as well as multiplicity distribution with various target nuclei of aluminum, copper, tin and tungsten. Considering the result of previous 400 GeV/c proton-nucleus experiment by means of nuclear emulsion chamber, we can also investigate energy dependence of various quantities such as momenta in multiplicity distribution, rapidity density and absorption cross sections.

We propose to perform same kind of exposure as previous experiment but by 800 GeV proton beam.

REQUIRED EXPERIMENTAL CONDITIONS

- 1) Beam: parallel and mono-energetic proton beam.
- 2) Energy: 800 GeV or maximum available energy.
- 3) Amount of irradiation: 5×10^4 proton/cm² within an error of 30 %.
- 4) Setting of the chamber: the beam should be irradiated perpendicularly as possible to the front surface of the chamber.

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DETECTOR

The chamber is consisted of 46 nuclear emulsion plates and 0.050~0.100 mm thick metal target plates interleaved alternately, which are fixedly positioned in box of outer dimension 11.6 x 11.6 cm² with depth 10.8 cm. The front surface of the box has window of 5 x 5 cm with its center coaxially positioned with center axis of the outer box. Schematic view of the chamber is shown in the following.

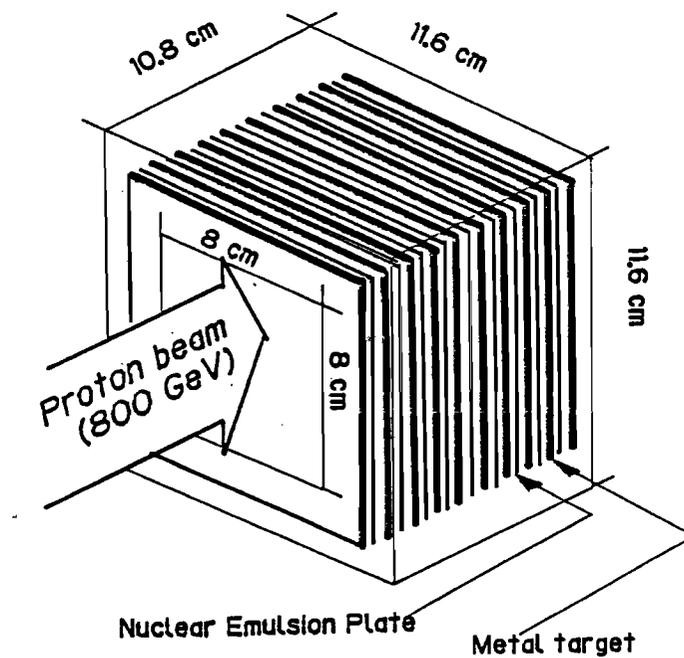


Figure. Schematic view of the chamber.

REFERENCE

- 1) F. Fumuro, R. Ihara and T. Ogata, Nuclear Physics B152(1979)376.