

Fermilab Proposal No. 371

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Research Proposal

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RESEARCH PROPOSAL

The investigation of the production of heavy fragments
induced by particles of high energies.

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- Summary

The production of fragments obtained by irradiation of nuclei with high energy particles is to be investigated using solid state track detectors. The cross sections of the process in dependence of the energy and nature of the projectiles will be studied, as well as the change of the cross sections in dependence of Z of the target nucleus.

- Physics Justification

The purpose of this project is to investigate the emission of heavy fragments in dependence of the nature and energy of incident particles. The use of solid state track detectors makes possible the investigation of fragment emission under very favorable conditions (small background, good space resolution, the measurement of fragments track length, determination of angles between the fragments, etc.). We are specially interested in the fission process. The existing results indicate that the change of the fission cross section in function of energy of the incident particles in energy interval (10 - 25) GeV depends on the ordinal number of target elements.

- Apparatus Needed

Both the target and detectors are to be in a sandwich. The sandwiches make a stack of $a \times b \times c$ ($a = 3$ cm; $b = 2$ cm; $c = 0,5 - 1$ cm) vacuummatted in the polyethylene envelop. The so prepared sandwich will be sent from our laboratory to Batavia with the necessary flux indicated on it. The testing should be done by a flux of about $10^{11}/\text{cm}^2$. The irradiated stack will be investigated in the laboratory in Beograd.

- Scope of the Experiment

The irradiated stack will be investigated in our laboratory in Beograd. The time of data accumulation will depend on the flux of incident particles.