MEASUREMENTS OF 1 GeV PROTON FISSION CROSS SECTIONS FOR HEAVY NUCLEI

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Fission processes constitute a physical base for modern nuclear energetics /1/. Future prospects of its development are connected with the use of fission and spallation processes induced in heavy nuclei by protons in the energy region of 1 GeV. Thus the measurements of 1 GeV proton fission cross sections for heavy nuclei may be considered as an experimental investigation of the problem at an elementary level.

The measurements were carried out at the external proton beam of the Gatchina synchrocyclotron with a special method of fragment detection and beam intensity monitoring. Thin targets of ^{238}U, ^{232}Th, ^{209}Bi and ^{208}Pb were placed between two semiconductor surface-barrier silicon detectors, both separated from the target by a distance of 0.5 mm. A fission event was fixed by a coincident detection of two complementary fragments. A beam intensity of the order of 10^5 s^{-1} was measured with a great accuracy by scintillation telescopes. Experimental data on the measured cross sections /2/ are shown in the table.

Table

TARGET	$^{238}_{92}U$	$^{232}_{90}Th$	$^{209}_{83}Bi$	$^{208}_{82}Pb$
Fission cross section σ_f, mb	1480±60	940±60	183±9	132±13

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