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13th International Conference on Emerging Nuclear Energy Systems June 03-08, 2007, İstanbul, Türkiye**STUDY OF FISSION CROSS SECTIONS INDUCED BY NUCLEONS AND PIONS
USING THE CASCADE-EXCITON MODEL CEM95****Zafar Yasin^{a,*}, M. Ikram Shahzad^b**^aDepartment of Nuclear Engineering, PIEAS, P.O. Nilore, Islamabad, Pakistan^bPhysics Research Division, PINSTECH, P.O. Nilore, Islamabad, PakistanE-Mail: yasinzf@yahoo.com; zfyasin@yahoo.co.in**ABSTRACT**

Nucleon and pion-induced fission cross sections at intermediate and at higher energies are important in current nuclear applications, such as accelerator driven-systems (ADS), in medicine, for effects on electronics etc. In the present work, microscopic fission cross sections induced by nucleons and pions are calculated using the cascade-exciton model code CEM95 for different projectile-target combinations; at various energies and the computed cross sections are compared with the experimental data found in literature. A new approach is used to compute the fission cross sections in which a change of the ratio of the level density parameter in fission to neutron emission channels was taken into account with the change in the incident energy of the projectile. We are unable to describe well the fission cross sections without using this new approach. Proton induced fission cross sections are calculated for targets ^{197}Au , ^{208}Pb , ^{209}Bi , ^{238}U and ^{239}Pu in the energy range from 20 MeV to 2000 MeV. Neutron induced fission cross sections are computed for ^{238}U and ^{239}Pu in the energy range from 20 MeV to 200 MeV. Negative pion induced cross sections for fission are calculated for targets ^{197}Au and ^{208}Pb from 50 MeV to 2500 MeV energy range. The calculated cross sections are essential to build a data library file for accelerator driven-systems just like was built for conventional nuclear reactors. The computed values exhibited reasonable agreement with the experimental values found in the literature across a wide range of beam energies.

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