

Measurement of total cross sections for fast neutron-induced fission of U-238 in the energy range 35 to 100 MeV

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There has been a high level of interest across the world in the use of well-characterized neutron beams of energy 10-200 MeV for investigating physical problems connected with radiation therapy, radiation protection and intermediate-energy nuclear physics and neutron cross section measurements that span a wide range of applications. Experiments in these fields often require that the neutron fluence at the energy of interest be measured accurately. Techniques for the measurement of neutron fluence at neutron energies below about 20 MeV are relatively well established and documented. The situation is less favourable at neutron energies above about 20 MeV for several reasons, including the lack of suitable cross section standards. These have large uncertainties and the data above 30 MeV are scarce.

This work evaluates cross section standards for fast neutron-induced fission of ^{238}U in the energy range from thermal to 200 MeV.

We have measured cross-sections at five energies between 35 MeV and 100 MeV at IThemba LABS and present preliminary results.

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