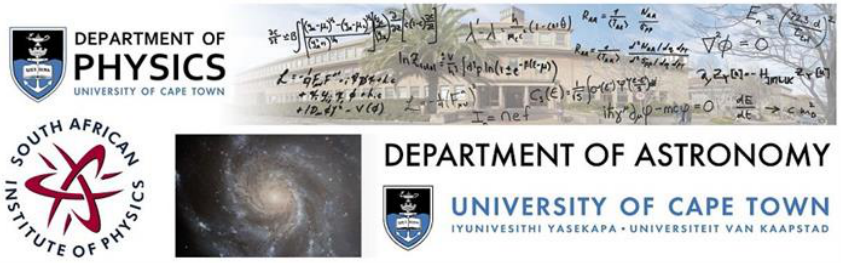

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Measurement of ²³⁸U fission cross sections using quasi-monoenergetic neutrons with energies from 35 MeV to 100 MeV.

Wednesday, 6 July 2016 11:50 (20 minutes)

Abstract content
   (Max 300 words)
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The fast neutron beamline at iThemba LABS is presently proposed to be developed into an accredited facility for fast neutron metrology. Cross sections of neutron-induced reactions on ²³⁸U are very important as reference standards for fast neutron metrology. The cross section of the ²³⁸U(n,f) reaction has been measured for quasi-monoenergetic neutron energies in the range from 35 MeV to 100 MeV using a fission chamber of natural uranium composition. Proton recoil telescopes, composed of thin silicon detectors coupled to a sodium iodide scintillation detectors were utilised for the determination of the incident neutron fluence using the well-known cross sections for n-p elastic scattering. Emphasis during the analyses was placed on data reduction and background subtraction to reduce measurement uncertainty. Presented are the measurements and the calculation method to determine the cross section values.

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