Seminar

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Institute for Plasma Research

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Title: Measurement and evaluation of nuclear data with detailed covariance analysis

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Date: 9th January, 2026 (Friday)

Time: 10:30 AM

Venue: Seminar Hall, IPR

Abstract

We present results of our experimental determination of the ^{232}Th(n, 2n) ^{231}Th cross section at six different neutron energies. Two experiments were performed at the BARC-TIFR Pelletron Accelerator facility (BPA) using the ^{7}Li(p, n) reaction at neutron energies 8.97 MeV, 10.49 MeV, 14.46 MeV, 16.52 MeV and 18.36 MeV, respectively. Another experiment was performed at the Purnima Neutron Generator facility (PNG) using the 3H(d, n) reaction at 15.04 MeV. We provide a selection of the ^{232}Th(n, 2n) ^{231}Th cross section data from the IAEA-EXFOR database, renormalisation and covariance treatment. A GLSM-based evaluation of Indian ^{232}Th(n, 2n) ^{231}Th data with full covariance matrix is presented.

We present our study on the examination of the possibility of interpolating covariance data. A critical re-analysis of the ^{233}Pa(2n, f) reaction dataset is provided. We provide a quantitative assessment of burnup effects in neutron activation analysis of targets. Initial attempts on covariance error propagation using the sandwich approach for IRDFF data (ITER & fusion applications) are also presented.

Keywords — Evaluation of nuclear data, ^{232}Th(n, 2n) ^{231}Th, Cross section, Measurement of nuclear data, Covariance, GLSM, Renormalisation of experimental data, Neutron activation data, burnup, IRDFF covariance error propagation.
