

Nuclear reference data for high energy applications

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High-quality nuclear data is the most fundamental underpinning for all neutron metrology applications. A review of recommended evaluated nuclear data for high-energy dosimetry applications will be presented, focusing on IAEA Neutron Data Standards (nds.iaea.org/standards) and the International Reactor Dosimetry and Fusion File (IRDFF-II).

Neutron data standards include evaluated fission cross sections on H, U-235, and U-238 targets that extend up to at least 150 MeV.

Reference neutron spectra, like the Cf-252(sf) spectrum, are also included, serving for the validation of evaluated dosimetry cross-section data as well as to define the efficiency of multiple neutron detectors.

The International Reactor Dosimetry and Fusion File (IRDFF-II) contains a consistent set of nuclear data for fission and fusion neutron metrology applications up to 60 MeV neutron energy. The IRDFF-II library includes 119 metrology reactions and five metrology metrics used by the neutron dosimetry community. The recommended decay data, particle emission energies, and probabilities for 68 activation products are also listed, together with 29 neutron benchmark fields (including some high-energy fields) for the validation of the library contents. The IRDFF-II library and comprehensive documentation are available online at nds.iaea.org/IRDFF/.

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