

Nuclear reaction cross sections in the new ENDF/B-VII database and their relevance to applications in nuclear science

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The US nuclear reaction community is issuing the new ENDF database referred to as ENDF/B-VI in early 2006. This represents improvements in neutron, proton, and photon cross sections that have been worked on for the last 5 years by a community of over 50 people from national laboratories and universities. Nuclear reaction theory calculations, together with new measurements from many institutions, have facilitated major improvements in this database. The ENDF database is used in many applications in basic and applied nuclear technology, and present completed representations of cross sections, spectra, and angular distributions, that are needed in radiation transport codes.

I will describe some of the major advances, especially those that have an impact in applications. I will present some illustrative examples, that will include active interrogation nonproliferation technologies to detect smuggled highly-enriched uranium; medical applications for dose deposition calculations; and advanced reactor concepts.