Nuclear data for neutron-induced reactions on U-235 measured at DANCE

M. Jandel
C-NR, Los Alamos National Laboratory

Many areas of applied nuclear physics such as nuclear forensics, stockpile stewardship, nuclear non-proliferation, and nuclear energy, require new or improved cross sections of neutron-induced reactions. High precision measurements of U-235 neutron capture cross section were performed at Los Alamos Neutron Scattering Center (LANSCE), Los Alamos National Laboratory (LANL). The measurements were performed using unique LANL facility: Detector for Advanced Neutron Capture Experiments (DANCE). Data on cross sections were obtained in incident neutron energy range from 4 eV to 1 MeV. Significant discrepancies were observed between the existing evaluations and the DANCE measurement.

In addition, the properties of the prompt-gamma ray emission in neutron-induced fission of U-235 were extracted in form of correlated data on gamma-ray multiplicity versus gammaray energy and total energy. The results from DANCE were used to constrain the theoretical models.