Contribution ID: **9** Type: **not specified**

Measurement of prompt fission gamma-rays with lanthanum halide scintillation detectors

Tuesday 31 August 2010 15:15 (25 minutes)

A challenging task within the modelling of new generation reactor neutron kinetics is the calculation of the gamma-heat deposition e.g. in steel and ceramics reflectors without UO2 blankets, which is required to be known with an uncertainty as low as 7.5%. A major difficulty in measuring the competition between neutron and gamma-ray emission during fission fragment de-excitation is the suppression of background gamma-rays induced by prompt fission neutrons in the gamma-detector. A common method is to distinguish between gamma-rays and neutrons by their respective different time-of-flight, which however is limited by the timing resolution of the detector (not better than 5 ns for NaI). A promising approach seems to be the use of recently developed cerium-doped lanthanum halide crystal scintillation detectors.

Recently we performed an experiment at the 10 MW research reactor at the Institute of Isotopes in Budapest, dedicated to the measurement of the fission-fragment mass and kinetic energy distribution as well as prompt fission gamma-rays from thermal (cold) neutrons on 235U. The gamma-rays were measured with three LaCl3:Ce detectors and one LaBr3:Ce detector. We report on the status of the data analysis and present experimental results from the experiments as obtained thus far.

Author: OBERSTEDT, Andreas (Örebro University)

Co-authors: GÖÖK, Alf (TU Darmstadt and Örebro University); CANO-OTT, Daniel (CIEMAT Madrid); HAMBSCH, Franz-Josef (EC-JRC IRMM Geel); KARLSSON, Johan (Örebro University); TAKACS, Karman (IKI Budapest); SZENTMIKLOSI, Lazlo (IKI Budapest); BILLNERT, Robert (Örebro University); BORCEA, Ruxandra (EC-JRC IRMM Geel); OBERSTEDT, Stephan (EC-JRC IRMM Geel); BELGYA, Tamas (IKI Budapest); MARTINEZ PEREZ, Trino (CIEMAT Madrid); KIS, Zoltan (IKI Budapest)

Presenter: OBERSTEDT, Andreas (Örebro University)

Session Classification: Session 4: Experimental Techniques