Contribution ID: **200** Type: **not specified**

Characterisation of Nuclear Materials by using Neutron Resonance Analysis

Wednesday, 5 September 2018 13:30 (20 minutes)

Neutron-induced reactions can be used to study the properties of nuclear materials in the field of nuclear safeguards and security. The elemental and isotopic composition of these materials can be determined by using the presence of resonance structures in the reaction cross sections as fingerprints. This idea is the basis of two non-destructive analytical techniques which have been developed at the GELINA neutron time-of-flight facility of the JRC-IRMM: Neutron Resonance Capture Analysis (NRCA) and Neutron Resonance Transmission Analysis (NRTA). In particular, NRTA is an absolute analysis method which does not require sample preparation or any calibration using representative reference materials.In this work, we present the results of transmission measurements performed on certified reference nuclear materials consisting of uranium and plutonium samples with different isotope abundances. The experiments were carried out in a GELINA station with a short flight path of about 10 m to validate the NRTA technique in small-scale facilities with poor energy resolution. The impact of reliable nuclear data on the NRTA accuracy is highlighted when discussing the results obtained for the plutonium samples.

Primary author: Dr PARADELA, Carlos (European Commission, Joint Reseach Center JRC, Directorate G - Nuclear Safety & Security)

Presenter: Dr PARADELA, Carlos (European Commission, Joint Reseach Center JRC, Directorate G - Nuclear Safety & Security)

Session Classification: Nuclear Physics Applications