Contribution ID: **228** Type: **not specified**

Measurement of 235U(n,f) cross section between 10 and 30 keV

Thursday, 6 September 2018 15:40 (20 minutes)

The 235U(n,f) cross section is established as a standard reference for measurements and evaluations at thermal neutron energy and in the range between 150 keV and 200 MeV. Thanks, amongst other considerations, to this wide energy interval the 235U fission is one of the most used standards, but recent experimental data suggest the presence of discrepancies in the 235U(n,f) reaction cross section between 10 and 30 keV. Although not considered as a standard in this energy range, it is often used as reference for the measurement of the neutron flux at various facilities. Any correction to the values adopted in evaluated libraries has an immediate impact over all the results of experiments that use the 235U fission as reference. In order to overcome this problem an accurate measurement of 235U(n,f) cross section in the energy range between 10 and 30 keV has recently been performed in the n_TOF facility at CERN, where is available a neutron beam with a remarkable energy resolution and high instantaneous flux. A new experimental setup has been used, consisting of a stack of single pad silicon detectors and 235U, 10B and 6Li targets
placed directly on the beam, the boron and lithium are used as standard reference. This measurement represents the first case of fission products measured using silicon detectors at n_TOF facility, proving the suitability of silicons even in this critical configuration. The customized experimental apparatus and the data analysis with definitive results will be presented.

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Session Classification: Nuclear Physics Applications