Contribution ID: **774** Type: **not specified**

P2.203 Conceptual design of STUMM module for characterization of neutron and gamma radiation fields during commissioning phase of IFMIF DONES

Tuesday, 18 September 2018 11:00 (2 hours)

IFMIF-DONES (International Fusion Materials Irradiation Facility — DEMO-Oriented Neutron Source) will be built as a powerful neutron source to test suitable materials planned for the construction of future tokamaks like DEMO (Demonstration Fusion Power Plant). In the commissioning phase of IFMIF-DONES it is foreseen that a Start-Up Monitoring Module (STUMM) will be used for the characterization of neutron and gamma radiation fields.
The STUMM will be positioned inside the Test Cell just behind the DONES neutron source. It will be at the same position as the High Flux Test Module (HFTM) that planned for irradiation of samples. As a consequence, STUMM will be operated in extremely harsh radiation and high temperature conditions.
The main mission of STUMM is to characterize the neutron source (determine the energy and space distribution of neutron and gamma fluxes), to characterize the radiation fields at the location of the HFTM and to verify the results of neutronic modelling of those distributions. To fulfill its mission STUMM will be composed of selected detection systems and sensors characterized by a long radiation resistance and relatively small radiation sensitivity. At this stage of STUMM conceptual design following detection systems are foreseen: Rabbit System, N-16 system, gamma thermometers, SPND detectors, micro-fission chambers, thermocouples and strain gauges.
The conceptual design of STUMM is prepared as part of the Eurofusion Early Neutron Source work package (WPENS) in collaboration between engineers and physicists from the Institute of Nuclear Physics Polish Academy of Sciences (IFJ PAN) and the National Centre for Nuclear Research (NCBJ).

This work has been carried out within the framework of the EUROfusion Consortium and has received funding from the Euratom research and training programme 2014-2018 under grant agreement No 633053. The views and opinions expressed herein do not necessarily reflect those of the European Commission.

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Session Classification: P2