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# STUMM – Test module for a high intensity neutron stripping source

Urszula Wiącek, Institute of Nuclear Physics of the Polish Academy of Sciences, Krakow, Poland

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U. Wiącek<sup>1</sup>, B. Gabańska<sup>1</sup>, M. Gierlik<sup>2</sup>, A. Igielski<sup>1</sup>, R. Kwiatkowski<sup>2</sup>, R. Prokopowicz<sup>2</sup>, K. Pytel<sup>2</sup>, M. Tarchalski<sup>2</sup>, I. Zychor<sup>2</sup>

<sup>1</sup> Institute of Nuclear Physics of the Polish Academy of Sciences, Krakow, Poland

<sup>2</sup> Narodowe Centrum Badań Jądrowych (NCBJ), 05-400 Otwock-Świerk, Poland

An intense neutron source based on the stripping reaction between deuterium and lithium will produce the neutron spectrum similar to that induced by the deuterium–tritium reaction in fusion plasma reactors. This accelerator source will be built for tests prior to the operation of the future tokamaks, e.g. DEMO. In this source an intense D<sup>+</sup> beam of a 40 MeV energy and intensity of 125 mA will strike a liquid lithium target, flowing at a speed of 15 m/s, providing an intense neutron flux density, about 10<sup>15</sup> n/m<sup>2</sup>/s, with a broad energy peak near 14 MeV.

As till now, no experimental results exist for such a kind source. All parameters of the neutron and photon fields, and working conditions like temperature and nuclear heating are foreseen based on theoretical and numerical calculations for the radiation transport. For verifying these predictions it is necessary to build a special test module, called STUMM, that means the Start-Up Monitoring Module.

STUMM will be positioned as close as possible behind the lithium target backplate and will be working only during the commissioning phase of the neutron source. The main mission of this device is to deliver information about irradiation parameters, to characterize the neutron source, to qualify the instrumentation and to validate theoretical calculations. It is also very important to measure the spatial distribution of neutrons and photons in the vertical and horizontal planes, perpendicular to the beam, and to characterize the temporal evolution and stability of the radiation field.

In this work a concept of STUMM is presented, including a description of the main objective of the module, proposition of its shape and the foreseen experimental instrumentation.

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