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Neutron Inelastic Scattering measurements at n_TOF

The development of the next generation of nuclear technologies require precise knowledge of a broad range of nuclear data. Specifically, the cross sections of reactions induced by fast neutrons play a crucial role in the design of Gen IV nuclear reactors, with four out of the six considered prototypes being of the fast reactor type. Fusion reactors also necessitate accurate neutron inelastic cross section data. Typically, low uncertainties in neutron inelastic scattering cross sections are achieved through means of γ spectroscopy. On this respect, enhancements can be achieved by taking advantage by the excellent timing response and large efficiency of LaBr₃(Ce) crystals. Given its outstanding neutron beam characteristics, the n_TOF facility is ideal for testing the feasibility of measuring the neutron-induced inelastic channel using LaBr₃(Ce) detectors. Preliminary results from the testing different LaBr₃(Ce) prototypes used to measure $^{24}\text{Mg}(n,n')$ will be presented.

Work-package

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