

Evaluation of Shielding Materials for the DD Type Neutron Generator in the Mini Labyrinth Experiment

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Abstract. The Institute of Nuclear and Physical Engineering is currently developing a special laboratory, the Laboratory of Neutron Applications, where a DD type neutron generator is planned to be purchased and used for research purposes. As the equipment will be installed in a new facility, shielding materials will have to be utilized, to minimize the dose rate obtained by the personnel working with the generator as well as all workers of the faculty, who could potentially get close to the laboratory. The selection of shielding materials is complicated by the fact, that the room is situated partially underground on special pillars with limited load capacity, therefore the used shielding must be light and cheap. In this paper we are comparing the shielding performance of available light materials with the certified Neutronstop shielding blocks, based on the measurement conducted at the STU Mini Labyrinth and simulation performed in the SCALE6 system. The paper includes results of the neutron disappearance XS and the half-value-thickness of selected materials, the dose map around the Mini Labyrinth and a simple economic feasibility estimation for the Laboratory of Neutron Applications.