

Evaluation of NEUTRONSTOP Shielding Blocks in the Mini Labyrinth Experiment

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As part of international cooperation, the research team from the Slovak University of Technology is involved in the development of new radiation shielding experimental workplaces for code verification. One of these activities is the so-called “Mini Labyrinth” workplace. The STU Mini Labyrinth, as its name implies, is a mini version of the original IHEP Labyrinth originally developed in the Russian Federation, currently with dimensions of 96x60x50 cm. The experimental setup is placed on a special deck in the neutron physics laboratory of STU and uses the remote source handling mechanism. It consists of several NEUTRONSTOP C5 shielding blocks (polyethylene with 5 % boron), several detector positions and two options to generate either thermal or fast neutrons. This paper investigates the effect of NEUTRONSTOP shielding blocks on the rate of thermal neutrons inside and outside the Mini Labyrinth experiment. The analysis is performed by both measurements using gas-filled neutron detectors and by simulations utilizing the SCALE6 system. In this measurement setup, the neutron source is placed inside the left side of the Mini Labyrinth with and without an extra moderator.

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