Theoretical Simulation and Experimental Testing of Advanced Shielding Materials Properties with Focus on Inhomogeneity and Build-up

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Abstract. To extend the research possibilities of the nuclear research group at Brno University of Technology, a gamma radiation shielding measurement benchmark assembly was designed and built. Experimental device will be used for fine attenuation coefficient and build-up factors measurement and for easy validation of theoretical simulation and calculation of shielding properties of selected materials. A large number of different radioactive emitters can be used in the assembly, as well as many different detectors and materials, which might be tested and results compared to understand well measurement results. A theoretical model was also created for the benchmark assembly and simulated in MCNP. Initial results show identical trends of values obtained by simulation and practical experiment.