

Monte Carlo Simulations of the iThemba LABS Neutron Beam Facility

iThemba LABS fast neutron beam facility (D-line vault) is one of the two facilities in the world that can provide quasi mono-energetic neutron beams in the energy from about 30 MeV to 200 MeV. The vault is currently undergoing an upgrade and development in order for it to meet the requirements for a medium and high-energy neutron metrology facility. One of the major challenges identified from the previous set-up was the epithermal neutron background due to leakage from the target area to the experimental area. As part of the ongoing refurbishment, to reduce epithermal background in the experimental area, Monte Carlo (MC) simulations aimed at benchmarking experimental data from previous investigations of the neutron background inside the vault are being conducted and will be presented.

[1] M. Mosconi et al., "Characterisation of the high-energy neutron beam at iThemba LABS", *Radiat. Meas.*, vol 45, pp. 1342-1345, 2010. doi:10.1016/j.radmeas.2010.06.044

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