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Upgrade of the iThemba LABS Fast Neutron Beam Facility towards ISO/IEC 17025 Accreditation

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The iThemba LABS fast neutron beam facility (D-line vault) is an international niche facility that can provide ns-pulsed quasi-monoenergetic neutron beams in the energy range of 30 to 200 MeV. Available neutron beam facilities with energy range similar to this facility are described in details by the EURADOS (European Radiation Dosimetry) Report [1]. The facility has remained practically unchanged since it was first built more than 30 years ago and over the years, a number of problems associated with low energy neutron backgrounds in the vault and the stability of the proton beam on target were identified [2].

As a plan going forward and motivation for the vault development, the National Metrology Institute of South Africa (NMISA) designated iThemba LABS facility as an entity responsible for providing traceability for the medium and high-energy neutron measurements in South Africa. This resulted in a formal collaboration between iThemba LABS, University of Cape Town, together with international partners Institute de Radioprotection et Sûreté Nucléaire (IRSN in France), National Physical Laboratory (NPL in UK) and Physikalisch-Technische Bundesanstalt (PTB in Germany) to upgrade the facility in order to achieve ISO/IEC 17025 accreditation status for the medium and high-energy neutron region. We present the status on the progress of the D-line vault upgrade, including results from previous measurements of the neutron background from the original configuration of the vault. Results from these measurements, together with results from Monte-Carlo simulations, were used to reconfigure the physical infrastructure of the D-line vault.

References
[1] Pomp S. et al., “High-energy quasi-monoenergetic neutron fields: existing facilities and future needs”, EURADOS, Braunschweig, Germany, EURADOS Rep. 2013-02 (May 2013).
[2] Mosconi M. et al., “Characterisation of the High-energy Neutron Beam at iThemba LABS”, Radiation Measurements 45, 1342-1345 (2010).

Apply to be considered for a student ; award (Yes / No)?

No

Level for award;(Hons, MSc, PhD, N/A)?

N/A

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