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Nuclear data measurements at white and quasi-monoenergetic sources of high-energy neutrons.

There is a clear and long-standing demand from the International Atomic Energy Agency (IAEA) to improve the situation of nuclear data, in particular reference cross sections, in the energy range above 20 MeV. Spallation neutron sources, such as n_TOF at CERN, are the workhorses for such measurements because they provide a continuous energy coverage. However, they pose specific technical challenges for neutron measurements at high energies due to the presence of intense prompt photon bursts (γ -flash), low duty cycle and high instantaneous event rates. This is why quasimonoenergetic sources such as the ${}^7\text{Li}(p,n)$ facility at iThemba LABS are attractive for detector development and complementary experiments at selected neutron energies. As an example, the measurement of the ${}^{235}\text{U}(n,f)$ cross section relative to the differential neutron-proton scattering cross section is discussed.

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