
THE n_TOF FACILITY AT CERN: PERFORMANCES AND FIRST PHYSICS RESULTS

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The neutron Time of Flight (nTOF) facility at CERN is a source of a wide range ($1 \text{ eV} < E_n < 250 \text{ MeV}$) flux of neutrons, generated by spallation of $20 \text{ GeV}/c$ protons onto a solid lead target. The goal of the nTOF is to provide unprecedented precision in neutron kinetic energy determination, which will in turn bring the much-needed precision in neutron-induced cross-section measurements.

The unique features of the nTOF facility (instantaneously very intense neutron flux, low duty cycle, high resolution and low background) makes possible the measurement of highly radioactive isotopes usually available in small quantities. Such measurements are vital for a range of studies in fields as diverse as nuclear technology, astrophysics and fundamental nuclear physics.

In this paper, the characteristics of the nTOF facility will be described, together with the main features of the high performance detectors and acquisition system used for cross-section measurements, and a summary of the results and experience acquired during the first years of operation.