

Nuclear Astrophysics at CERN n_TOF facility

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Nuclear astrophysics presents many cases that require neutron capture reaction data with high precision. In particular, refined data are needed for the stellar s-process nucleosynthesis.

The neutron time of flight (n_TOF) facility at CERN is a neutron spallation source; its white neutron energy spectrum ranges from thermal to hundreds of MeV, covering the full energy range of interest for nuclear astrophysics. The low repetition rate of the proton beam, the high instantaneous neutron flux, and the favourable background conditions in the experimental area make this facility unique for high resolution time-of-flight measurements of neutron induced reaction cross sections. The n_TOF collaboration is presently operating two different capture experimental set-ups. The first consists of two low-neutron sensitivity C_6D_6 detectors with the analysis relying on the Pulse Height Weighting technique. In addition, a Total Absorption Calorimeter, consisting of 40 BaF_2 crystals covering the whole solid angle, was used.

This contribution gives an overview on the astrophysical program performed at n_TOF facility. The results and the implications will be reported.