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Measurement of the neutron capture cross section of ^{64}Ni at n_TOF

Neutron capture cross sections of ^{64}Ni is an important parameter to accurately simulate the s-process and validate stellar models. As ^{64}Ni is among the seeds of the s-process, the uncertainty on its capture cross section has been shown to significantly affect the predicted abundances of many isotopes produced by the s-process both in massive and AGB stars. Moreover, the uncertain value of this cross section may be the cause of the discrepancy observed between predicted and measured ^{64}Ni isotopic ratios in SiC presolar grains. Indeed, the MACS reported by different releases of data libraries show discrepancies higher than a factor 2 at 5 keV. For these reasons, a new accurate time-of-flight measurement was carried out during summer 2023 at the n_TOF facility at CERN. At the moment, only preliminary results are available, but they already show important discrepancies with respect to the latest data library releases. These discrepancies are expected to significantly impact on the Maxwellian Average Cross Section at the energies of astrophysical interest.

Work-package

Facility identifier

n_TOF

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