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Recent highlights and prospects on (n,γ) measurements at the CERN n_TOF facility

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Neutron capture cross-section measurements are fundamental in the study of astrophysical phenomena, such as the slow neutron capture (s-) process of nucleosynthesis operating in red-giant and massive stars. One of the best suited methods to measure neutron capture (n,γ) cross sections over the full stellar range of interest is the time-of-flight (TOF) technique.

TOF neutron capture measurements on key s-process branching isotopes are very challenging due to the limited mass (~mg) available and the high experimental background
arising from the sample activity.. Overcoming the current experimental limitations requires
the combination of facilities with high instantaneous flux, such as n_TOF, with detection systems with an enhanced detection sensitivity and high counting rate capabilities.

This contribution will present an overview about the recent highlights in the field of (n,γ) measurements at n_TOF. The recent upgrades on the facility, such as the opening of the
high-flux n_TOF-NEAR activation station, and the future prospects for new measurements involving unstable targets will be discussed.

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