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## Spectroscopic data and nuclear structure studies using $(n\text{th}, 2\gamma)$ reaction and two-step gamma cascade method

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The quality of a number of areas that use nuclear data, such as astrophysical reactions, production of medical isotopes and rare isotope beams, and reactor technology is dependent on the accurate values for gamma ray transitions, level scheme, nuclear level density and radiative strength function. One of the most suitable techniques for the determination of these parameters is the two-step gamma-ray method based on the measurements of the two-step gamma-ray coincidences following thermal neutron capture. This technique can be used to search for new energy levels and gamma transition, place already known gamma transitions in the level scheme, constrain spin values of levels, as well as to determine nuclear level density and radiative strength function.

This technique was most recently successfully applied to  $^{94}\text{Nb}$  and  $^{56}\text{Mn}$  in experiments conducted at the PGAA facility of Centre for Energy Research (MTA EK), Budapest, Hungary and Technische Universität München, Forschungsneutronenquelle Heinz Maier-Leibnitz (FRM II), Garching, Germany, respectively. These two experiments combined had, among other results, over 50 new recommendations for energy levels and over 250 new recommendations for gamma transitions. These results proved that this technique can be used to provide new, accurate, data about the level scheme and nuclear structure. Among future plans for usage of this technique is a proposed experiment at the research reactor in Garching, Germany in order to investigate  $^{108}\text{Ag}$  and  $^{110}\text{Ag}$  nuclei.

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