



Contribution ID: 325

Type: Oral

Experimental investigation of the $(n,x\gamma)$ reactions using tagged neutron method

Sunday, 3 December 2023 11:50 (15 minutes)

Neutron-induced reactions is a unique tool for investigation of the structure of the atomic nuclei. Analysis of the neutron inelastic scattering data as well as information about processes with charged particle emission allows one to estimate shape and radii of nuclei and deduce the reaction mechanism.

The γ -radiation emitted by excited products of neutron-induced reactions carries information about their properties. Precise information about spectra of γ -quanta and cross-sections of their emission are important for modeling of nuclear facilities, improvement of well logging technique and development of compact setups for elemental analysis. The currently available data is replete with inaccuracies and incomplete [1].

A new experimental setup for measurement of the γ -quanta emission cross-sections was constructed in the framework of the TANGRA (Tagged Neutrons & Gamma Rays) project based on the 9-years experience [2-6]. Usage of the tagged neutron method significantly decrease the amount of background events and requires specific data processing procedures and impacts on the experimental setup structure.

The design of the new experimental setup and data processing features will be discussed.

This work is supported by the RSCF grant 23-12-00239.

1. S. P. Simakov et al. Status of Experimental and Evaluated Discrete Gamma-Ray Production at $E_n=14.5$ MeV. IAEA, Vienna, Austria. 1998.
2. I.N. Ruskov et al., Phys. Proc. 64, 163 (2015).
3. D.N. Grozdanov et al., Phys. Atom. Nucl. 5, 588 (2018).
4. N.A. Fedorov, D.N. Grozdanov, V.M. Bystritsky et al., Eur. Phys. J. Web of Conf. 177, 02002 (2018).
5. N.A. Fedorov et al., Phys. Atom. Nucl. 82, 343 (2019).
6. N.A. Fedorov et al., EPJ A 57, 194 (2021).

Attendance Type

In-person

Primary author: FEDOROV, Nikita (JINR)

Co-authors: GROZDANOV, Dimitar; FILONCHIK, Polina (JINR, MIPT); Dr KOPATCH, Yuri (JINR); Dr TRETYAKOVA, Tatiana (JINR, MSU); Dr RUSKOV, Ivan (INRNE BAS); Mr HRAMCO, Konstantin (JINR)

Presenter: FEDOROV, Nikita (JINR)

Session Classification: Session 14

Track Classification: Neutron Physics