

Photofission experiments at the ELI-NP facility*

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The possibilities for photofission experiments at the new ELI-NP facility will be discussed. At ELI-NP, high power laser systems together with a very brilliant gamma beam are the main research tools [1-3]. The status of the project will be reported. The γ -beam system and the expected performance of the electron accelerator and the production lasers will be discussed. The targeted operational parameters of the γ beam will be described. At ELI-NP, next to research on fission barriers through measurements of transmission resonances [4,5] and investigation of rare fission events, such as ternary photofission [6], the possibilities for studies of the structure of neutron-rich exotic nuclei are considered. Two types of experiments related to the structure of fission fragments will be discussed, in-beam spectroscopy of fission fragments and separation of the isotopes of interest with the IGISOL technique, and experiments with them, such as β -decay or mass measurements. Four basic set-ups are under consideration for these studies, namely a double Bragg TPC, a general purpose charge-particle detector array, based on THGEM technology for fragment identification, an IGISOL beam line and the ELIADE Ge detector array, coupled to different ancillary detectors for in-beam spectroscopy will be discussed, taking into consideration the optimal use of the γ beam.

References:

- [1] ELI-NP White Book, http://www.eli-np.ro/documents/ELI-NP_WhiteBook.pdf
- [2] N.V. Zamfir, EPJ Web of Conferences 66, 11043 (2014)
- [3] D.L. Balabanski et al., Acta Phys. Pol. B 45, 483 (2014)
- [4] P.G. Thirolf et al., EPJ Web of Conferences 38, 08001 (2012)
- [5] L. Scige et al., Phys. Rev. C 87, 044321 (2013)
- [6] M. Verboven, E. Jacobs, D. De Frenne, Phys. Rev. C 49, 991 (1996)

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