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”Gamma and fast-timing spectroscopy of 85Se isotopes populated in fission”

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Nuclides in the vicinity of double magicity have simple structure, possible to explain with the shell model. Then, the nuclei is described as well bounded core (built with magic number of nucleons) and walence nucleons. The excitation-energy spectrum is dominated by single particle extitations.
Understading how single particle states evolve as a function of neutron (or proton) number is of the main importance. Thus, there is a great need of systematic investigation of the nuclear structure of the nuclei in the the vicinity of the double magic nuclei.

In the double magic 78Ni region it was observed that proton single particle states 2p3/2 and 1f5/2 evolve as a function of neutron number and reverse in 73Cu nad 75Cu [1,2]. It is also crucial to observe neutron single particle states evolution as a function of proton number. Such investigations showed that the neutron gap between 3s1/2 and 2d5/2 orbitals reduce with decreasing Z for N = 51 isotones down to 83Ga, but the gap seems to enlarge again for 81Zn. Recognition of 85Se nuclei structure is the next step in this investigations.

The experiment was performed in IPN, Orsay on LICORNE and NUBALL facility.
Excited states in 85Se were populated in fission 232Th(n,f) for the first time.

This work was done in Nuball 2 collaboration.

Bibliography

[1] Phys. Rev. C 80, 054304 (2009)
[2] Phys. Rev. C 83, 014322 (2011)

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