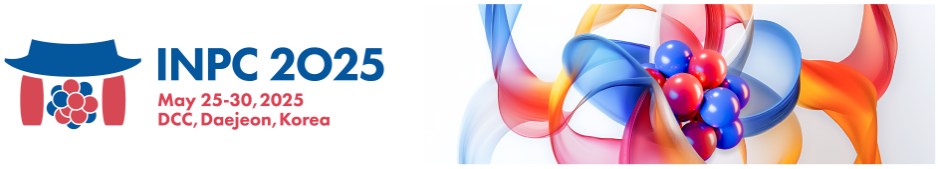

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Beta decay of selenium isotopes near N=50 shell closure

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The nuclides 84,86Se lie near N~50 and halfway between 78Ni and 90Zr in a neutron-rich region of high interest. Beta decay and nuclear structure information of populated excited levels can give a valuable benchmark for nuclear theories to understand nucleon-nucleon interaction in this region. However, curiously, for certain selenium isotopes the beta decay has been little studied, actually less than most other nuclides that lie just few neutrons outside the valley of stability. The decay of neutron-rich Se isotopes had been studied five decades ago, either with chemically separated sources, i.e., a mixture of all selenium isotopes where detected γ-rays are only assigned to individual isotopes via their decay time, or with the gas-filled recoil separator JOSEF. At the time, no γγ-coincidences or conversion electrons could be measured. Selenium is a challenging element for ISOL facilities, which explains why pure and intense beams of neutron-rich Se isotopes are not yet available. Beams of neutron-rich 84,86Se were produced by thermal neutron-induced fission of 235U at Institut Laue-Langevin. The beams of interest were mass and energy separated by the LOHENGRIN separator. At the focal plane the ions were implanted into a thin stopper foil and decays were measured using two experimental setups: (i) a ⊠-e- spectroscopy setup comprising two HPGe clover detectors and one Si(Li) detector, and (ii) a fast-timing setup consisting of four LaBr3 detectors. A new energy level in 84Br has been identified, and log ft values to and lifetimes of excited levels in 84Br have been measured. Preliminary results of several lifetimes of excited states of 86Br will also be presented. Finally, the measured log ft values and lifetimes are compared with shell-model calculations and second Tamm-Dancoff approximation (STDA) model predictions.

Primary author: KIM, Yung Hee (CENS)

Co-authors: MOON, Byul (Center for Exotic Nuclear Studies, Institute for Basic Science); RÉGIS, J. -M. (Institut für Kernphysik, Technische Universität Darmstadt); LEE, Jaehwan (Korea University); Dr DUGAS, Jean-Michel (Institut Laue Langevin); KÖSTER, Ulli

Presenter: KIM, Yung Hee (CENS)

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