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Experimental results on the Coulomb excitation of exotic nuclei at the R3B-LAND setup

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Coulomb excitation is a powerful tool to investigate the collective response of exotic nuclei, providing a unique insight into the dynamical properties of nuclei located far from stability. The experimental low-lying dipole data obtained in such experiments not only provides valuable information for the nuclear equation-of-state through the observation of the Pygmy Dipole Resonance (PDR), but also for nucleosynthesis scenarios, such as the rp-process.

Several experiments have been carried out in the past years using the R3B-LAND setup at GSI in Darmstadt, in which the Coulomb excitation of unstable nuclei has been investigated. The systematic measurement of a neutron-rich portion of the Sn isotopic chain has revealed PDR strength above the one-neutron threshold. The measured strength is used to constrain the asymmetry term of the nuclear equation-of-state, which has an impact on the behavior of not only exotic nuclei, but also on objects of astrophysical interest, such as neutron stars. Preliminary data from more recent experiments will be discussed, namely for neutron-rich Ni and neutron-deficient Ar isotopes. In particular, the differential cross sections for the neutron decay channels of 68Ni will be compared to other experimental data, obtained by virtual photon scattering. Data on the proton decay channels of 32Ar and 34Ar will also be presented, for which a proton-related PDR has been predicted by an RPA calculation.

Primary author: ROSSI, Dominic (GSI)

Co-authors: Mr LANGER, Christoph (Goethe University Frankfurt); Prof. KRATZ, Jens Volker (Johannes Gutenberg University of Mainz); Dr BORETZKY, Konstanze (GSI Helmholtzzentrum fuer Schwerionenforschung GmbH); Mrs LEPYOSHKINA, Olga (Technical University of Munich); Dr PLAG, Ralf (GSI Helmholtzzentrum fuer Schwerionenforschung GmbH); Prof. KRUECKEN, Reiner (Technical University of Munich); Prof. REIFARTH, Rene (Goethe University Frankfurt); Dr GERNHAEUSER, Roman (Technical University of Munich); Prof. AUMANN, Thomas (Technical University of Darmstadt); Dr LE BLEIS, Tudi (Technical University of Munich)

Presenter: ROSSI, Dominic (GSI)

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