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In-beam γ -ray spectroscopy of nuclei in the ^{132}Sn region performed at RIKEN

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The nuclei around the doubly magic nucleus ^{132}Sn ($N=82$ and $Z=50$) are of great interest both for nuclear structure investigations and nuclear astrophysics. Studying these systems, information about the evolution of nucleon-nucleon correlations, quadrupole collectivity and single-particle energies can be obtained. New experimental information allows to test different nuclear models and examine their validity in this region of the nuclear chart.

In April 2015, an experiment was performed at the Radioactive Isotope Beam Factory at RIKEN (Tokyo, Japan) to study neutron-rich nuclei in the ^{132}Sn region using in-beam γ -ray spectroscopy. The exotic nuclei were produced via the projectile fission of a primary ^{238}U beam at 345 MeV/u. The standard configuration of the BigRIPS and ZeroDegree spectrometers was used to select and identify the secondary beam [1]. After being identified in BigRIPS, the secondary beam impinged on C and Au targets to induce knockout reactions and Coulomb excitation. The γ rays emitted in the decay of excited states in several $N=82-84$, $Z\geq 50$ isotopes were detected using the DALI2 spectrometer, which consisted of 186 NaI(Tl) detectors.

In this contribution, I will discuss the new experimental information we obtained with respect to the γ decay of unbound states in ^{133}Sn [2], the Coulomb excitation of ^{136}Te [3] and other selected results.

[1] T. Kubo et al., Prog. Theor. Exp. Phys. 2012, 3C003 (2012).

[2] V. Vaquero, A. Jungclauss et al., Phys. Rev. Lett. 118, 202502 (2017).

[3] V. Vaquero, A. Jungclauss et al., in preparation.

Selected session

Nuclear Structure and Dynamics

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