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Collectivity along N=50: the neutron-magic 92 Mo and 94 Ru

The 100Sn nucleus, being the heaviest bound doubly-magic nucleus with equal number of protons and neutrons, has attracted considerable interest from the experimental as well as theoretical point of view. In particular, the structure of this nucleus and its neighbours are excellent benchmark cases to test state-of-the-art shell-model calculations in the region. Such models, predict an inversion of the B(E2; 4+ ⟶ 2+) trend towards the complete occupation of the g9/2 orbital -thus towards 100Sn-, owing to an increasing pairing-strength along the N = 50 isotones [1], differently to what has been observed for the neutron-rich Z = 28 isotopes, where neutrons occupy the same orbitals.
To test experimentally this phenomenon, the AGATA gamma array, installed recently at the GANIL laboratory, has been used, in combination with the IKP Cologne plunger [2], with the aim to measure
the reduced transition probabilities for the 4 + ⟶ 2 + and 2 + ⟶ 0 + yrast transitions in 94Ru and 92Mo nuclei.
The multi-nucleon transfer (MNT) reaction mechanism has been unconventionally [3] used to
populate the proton rich nuclei of interest. Contrary to fusion evaporation, MNT reactions allow, to populate directly medium to low angular momentum states, even in presence of isomers, thus, allowing
the direct determination of the lifetimes.
In this experiment, a 92 Mo beam with an energy of 716.9 MeV impinged in the stretched 92 Mo target of the Plunger, while a 24 Mg foil was used to degrade the energy of the reaction products. The reaction products of interest were identified with the magnetic spectrometer VAMOS++ [4], while the gamma-ray in coincidence were measured using AGATA [5].
Preliminary results on the obtained lifetimes and reduced transition probabilities for the 4 + ⟶ 2 + and 2 + ⟶ 0 + yrast transitions in 94Ru and 92Mo will be shown. In this contribution these results will
be interpreted on the basis of shell model predictions, allowing also for the comparison of the nuclear structure trends between the valence mirror symmetry partners 56–78Ni Z = 28 isotopes and 78Ni-100Sn N = 50 isotonic chain.

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Primary authors: Dr GADEA, Andres (IFIC, CSIC-University of Valencia); Dr DOMINGO PARDO, César (IFIC (CSIC-University of Valencia)); PÉREZ VIDAL, Rosa María (IFIC-CSIC)

Presenter: PÉREZ VIDAL, Rosa María (IFIC-CSIC)