Contribution ID: **7** Type: **Poster (In person)**

Coulomb excitation of 79,80Zn

Wednesday 29 November 2023 17:46 (1 minute)

For nuclei with N around 50, several pieces of evidence supporting shape coexistence close to ^{78}Ni have been found. In particular, the ∼940-keV $1/2^+$ isomeric state in ^{79}Zn has been interpreted as an intruder state, related to neutron excitations across N=50. Laser-spectroscopy measurements found a large isomeric shift for this state with respect to the ^{79}Zn $9/2^+$ ground state, hinting at its quadrupole deformation of β=0.22, considerably larger than β=0.15 of the ground state. In order to probe the quadrupole deformation of the intruder isomer in ^{79}Zn, we used a post-accelerated ^{79}Zn beam from ISOLDE that consisted of a mixture of nuclei in the $9/2^+$ ground state and the $1/2^+$ isomeric state, to populate excited states built on these two different configurations via Coulomb excitation on ^{196}Pt and ^{208}Pb targets.
During the same campaign a beam of ^{80}Zn (with a magic neutron number N=50) was used to to probe via the same experimental technique the B(E2) transition probabilities from the 4^+ and 2^+ states and to possibly identify non-yrast states in this nucleus. The results will serve as a benchmark for large scale shell-model calculations in the doubly closed-shell ^{78}Ni region.
In both experiments, γ rays were detected by the Miniball array, while scattered projectiles and beam recoils by an annular DSSD detector placed at forward angles. We will present preliminary results of this study, providing evidence for Coulomb excitation of states built on the intruder isomer, and discuss their possible implications in the context of the deformation of the $1/2^+$ isomer in ^{79}Zn, and of the ^{80}Zn ground state.

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Session Classification: Poster Session