

Direct reactions and spectroscopy with hydrogen targets: past 10 years at the RIBF and future prospects

Contribution ID: 90

Type: **Invited talk**

The development of deformation at $N=40$ (ZOOM)

Tuesday, 1 August 2023 13:35 (30 minutes)

Shell model calculations constitute a very powerful tool to predict with very good accuracy some experimental observables. However, when treating collective behavior, the large number of nucleons involved in the structure of the nuclear states and the size of the valence space may preclude these calculations because of the large matrices to be diagonalized.

The development of islands of inversion at the magic numbers, as for example that $N=40$ where large deformed nuclei have been found, can be interpreted in terms of the available single-particle levels around the Fermi surface (that favor quadrupole correlations) and the associated dynamical symmetries, variants of the $SU(3)$ symmetry. Following the suggestion of these symmetries, a smart choice of the model space can be done, making these calculations doable.

After an introduction to the theoretical method, several results will be shown, also in comparison with the experimental data.

Primary author: LENZI, Silvia

Presenter: LENZI, Silvia

Session Classification: Island of inversion at $N=40$