

Isospin symmetry beyond the proton dripline in the fp shell: A=55 T=3/2 mirror nuclei

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Using radioactive beams provided by the RIBF facility, Riken, Tokyo, Japan, we explored the excited states of the exotic proton-rich nucleus ^{55}Cu . We could study such nucleus, characterized by an isospin $T=3/2$, using in-beam γ -ray spectroscopy, despite it is unbound, lying beyond the proton dripline. The study exploited three distinct reaction mechanisms: inelastic excitation, single proton, and single neutron knockout. Through comparative analysis with its isobaric analogue states, the mirror nucleus ^{55}Fe , spins and parities have been tentatively assigned to the observed excited states, allowing the study of isospin-non-conserving phenomena at the extreme of the nuclear landscape. We could understand within the Shell Model the observed excitation energies and mirror energy differences, demonstrating reasonable agreement with theoretical predictions.

Presenter: RECCHIA, Francesco (Dipartimento di Fisica dell'Universit' a di Padova and INFN, Sezione di Padova)

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