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Probing simple patterns in complex nuclei with transfer reactions[1]

JOLIE CIZEWSKI, Rutgers University

The first observation of the O(6) limit of the Interacting Boson Model provided an unexpected benchmark for nuclear structure. A shape intermediate between a spherical vibrator and deformed rotor was a new simple pattern that described the complex nucleus, 196Pt. Shortly thereafter simple patterns in odd-mass nuclei were recognized as the coupling of a fermion to O(6) structures of the core. In addition to selection rules for electromagnetic transitions, there were now selection rules for single-particle transfer. As the properties of nuclei further from stability are explored, identifying simple patterns in complex nuclei becomes even more important as benchmarks in extrapolations of nuclear models to even more exotic nuclei. Identifying such benchmarks requires a full spectrum of spectroscopic probes, including single-particle transfer reactions. The present talk will provide an overview of how transfer reactions have been used to identify simple patterns in complex nuclei, from proton transfer reactions near 196Pt to recent neutron transfer work near 132Sn, eight neutrons from stability.

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