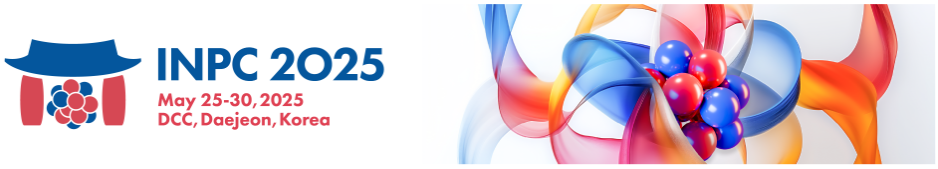

Contribution ID: **627** Type: **Invited Talk for Parallel Sessions (Invitation Only)**

Structure within the N=40 Island of Inversion

Tuesday, 27 May 2025 11:00 (25 minutes)

The focus of this work is neutron-rich Fe and Mn isotopes with N~40, which lie within an Island of Inversion approximately centered at ⁶⁴Cr. Here, a quenching of the N=40 sub-shell gap allows multi-particle, multi-hole excitations and deformation to develop in the ground-state configurations of nuclei in the region. Limited spectroscopic information has been collected so far in the region of N~40 below ⁶⁸Ni. For the even-even nuclei, the 2⁺₁ and 4⁺₁ state energy systematics has been explored and, for the Fe and Cr isotopes, of B(E2; 2⁺₁->0⁺₁) values have been measured up to ⁶⁸Fe and ⁶⁴Cr. Large-scale shell model (LSSM) calculations well reproduce the energy systematics of the observed low-lying states of the even-even Fe and Cr isotopes around N=40. However, spectroscopic factor and more complete level scheme predictions in the region have not yet been benchmarked by experimental results.

Proton knockout reactions on the neutron-rich N=38 and N=40 isotopes ^{64,66}Fe and ^{63,65}Mn have been performed to investigate the proton spectroscopic factors of the parent nuclei. We will discuss the results of this measurement as well as a complementary secondary fragmentation measurement, and interpret in comparison with both LSSM and Nilsson model calculations.

Primary author: CRAWFORD, Heather (Lawrence Berkeley National Laboratory)

Presenter: CRAWFORD, Heather (Lawrence Berkeley National Laboratory)

Session Classification: Parallel Session

Track Classification: Nuclear Structure