

Intruder structure in odd-A ^{69}Co

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A wealth of experimental and theoretical study in recent years has been motivated by the presence of unexpected low-energy states in odd-A nuclei near the $Z = 28$ shell closure. Beta-decay studies were undertaken at the National Superconducting Cyclotron Laboratory to investigate the odd-A nucleus, $^{69}\text{Co}_{42}$. A new beta-decaying isomeric state is proposed in ^{69}Co based on differences in beta-decay half-lives and delayed gamma-ray intensities between direct production of ^{69}Co in fragmentation and population of ^{69}Co following the decay of ^{69}Fe . The beta-decaying state is tentatively assigned a $1/2^-$ spin and parity, similar to the $1/2^-$ isomeric state in neighboring $^{67}\text{Co}_{40}$. The existence of the $1/2^-$ states in the neutron-rich odd-A Co isotopes can be attributed to the excitation of a proton across the $Z = 28$ closed shell. Combined with complementary information on proton particle-hole excitations in the isotonic neutron-rich Cu isotopes, a sequence of intruder states is identified in the region around ^{68}Ni similar to heavier mass regions including the Sn and Pb isotopes. The identification of a beta-decaying isomer in ^{69}Co and its place in the systematics of intruder structures in this region will be presented.