

Normal and intruder configurations in the island of inversion

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In the island of inversion a coexistence of low-lying states with different shapes results from the relatively small energy gap between normal, spherical sd configurations and deformed intruder fp configurations arising from excitations beyond the $N = 20$ shell gap. The ground states of these shape coexisting configurations have been identified in $^{30,32}\text{Mg}$, however, band-like structures built on top are yet to be identified. Additionally from the excitation energy of negative parity states, resulting from the coupling of sd with fp neutrons, the size of the shell gap can be determined. In-beam gamma-ray spectroscopy of $^{30,32}\text{Mg}$ and surrounding nuclei has been performed in knockout reactions at the NSCL using the GRETTINA gamma spectrometer coupled to the S800 spectrograph. Using different reaction channels, normal or intruder configurations can be populated selectively. We will present new results on the structure of $^{30,32}\text{Mg}$ and discuss the transition into the island of inversion.

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Track Classification: Shell evolution through direct reactions - Spectroscopy of nuclear levels and nuclear shapes through direct reactions