

In-beam γ -ray spectroscopy of ^{32}Mg

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In the so-called “island of inversion,” the ground states of neutron-rich nuclei around $N = 20$ exhibit strong admixtures of intruder configurations, which lead to the breakdown of the $N = 20$ shell gap. At the heart of the island of inversion is ^{32}Mg , and from both experimental and theoretical perspectives, this nucleus serves as a critical benchmark.

In this contribution, we report on a precision in-beam γ -ray measurement of ^{32}Mg using two direct-reaction probes, one-neutron (two-proton) removal from ^{33}Mg (^{34}Si). By combining observables obtained in this measurement, a significantly updated level scheme for ^{32}Mg was constructed, and various structures coexisting in this key nucleus were unraveled. The experimental results were compared with predictions by state-of-the-art theoretical models. However, unexplained discrepancies remain, meaning that the structure of ^{32}Mg is not yet fully understood.

Experimental study on nuclear physics

Yes

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