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Where is the Neutron Drip-line for Oxygen?

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The presence of neutron and proton shell closures in the nucleus ^{28}O , together with strong continuum coupling effects, make neutron-rich oxygen isotopes a unique laboratory for testing nuclear models. In this work, we investigate neutron-rich oxygen isotopes using the Gamow Shell Model and the Density Matrix Renormalization Group method with an effective finite-range two-body interaction optimized to the bound states and resonances of $^{23-26}\text{O}$ assuming a core of ^{22}O . Our results suggest the existence of narrow excited states in ^{25}O and ^{27}O decaying by neutron and gamma emission, and a near-threshold ground-state for ^{28}O .

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