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Half-lives for alpha decay and proton emission

Alpha decay and proton emission are the dominant decay modes observed in proton-rich nuclei near the proton drip line. Investigating these phenomena provides valuable insights into the properties of exotic nuclei far from stability. In this study, we examine the half-lives for alpha decay and proton emission within the semiclassical WKB approximation framework, using the Deformed Relativistic Hartree-Bogoliubov theory in the continuum (DRHBc). By self-consistently incorporating both pairing correlations and continuum effects, DRHBc offers an accurate description of exotic nuclei. We compare and discuss our calculated results with experimental data and results from the Relativistic Continuum Hartree-Bogoliubov theory (RCHB).

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