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# Revealing the Dynamics of Three-Body Decay

## Content

The nucleus serves as a distinctive platform for exploring quantum many-body physics, characterized by the interplay between its two fermionic components: protons and neutrons. When nuclei extend beyond the dripline, the delicate balance between these fermionic components is disrupted, leading to spontaneous decay. As one of the latest discovered decay modes, two-proton decay is a unique three-body process, that involves the emission of two protons from the ground state of even- $Z$  neutron-deficient nuclei. Under such extreme conditions, the presence of a low-lying continuum can induce exotic phenomena. We will demonstrate how the internal structure influences the decay dynamics [1] and nucleon-nucleon correlations [2] in the asymptotic region. Through these detailed studies, we aim to provide new insights into the properties of open quantum systems [3].

[1] S. M. Wang and W. Nazarewicz, *Phys. Rev. Lett.* 126 (2021) 142501.

[2] S. M. Wang, W. Nazarewicz, R. J. Charity, and L. G. Sobotka, *J. Phys. G* 49, (2022) 10LT02.

[3] S. M. Wang, W. Nazarewicz, A. Volya, and Y. G. Ma, *Phys. Rev. Research* 5, 023183 (2023).

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