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Exploring Clustering in Exotic Nucleus

The study of atomic nuclei presents a compelling example of the challenges involved in solving many-body systems. Understanding these complexities reveals one of the most intriguing mysteries of the Universe: the fundamental information of atomic nuclei. The first theoretical models of molecular states and nucleon clustering in atomic nuclei were proposed in the 1930s [1]. In this context, we employ the relativistic Hartree-Bogoliubov (RHB) framework to explore these phenomena, which naturally incorporates critical relativistic effects such as spin-orbit interactions and scalar and vector potentials [2]. This study utilizes the RHB method to investigate nucleon clustering in nuclei near the neutron drip line, particularly at extreme conditions [3, 4]. Key insights are drawn from parameters such as the density profile and nucleon-nucleon correlation functions.

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