



国立研究開発法人理化学研究所 仁科加速器科学研究センター
第341回 RIBF核物理セミナー
RIKEN Nishina Center for Accelerator Based Science
The 341st RIBF Nuclear Physics Seminar

Effective field theory for weakly bound two-neutron halo nuclei

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We develop an effective field theory (EFT) framework for weakly bound two-neutron halo nuclei, or Borromean systems such as ^{22}C , where the two-neutron separation energy and the neutron-neutron virtual energy constitute the lowest energy scales of the problem. At leading order, the EFT involves a single dimensionless coupling exhibiting universal scaling behavior. We demonstrate that key observables, including the ratio of matter and charge radii, the electric dipole (E1) strength function, and the electric polarizability, depend only on the ratio of these two energies, for which analytic expressions are obtained. We further investigate next-to-leading-order corrections arising from the neutron-neutron effective range and evaluate their impact on these observables. Our results establish a unified and systematically improvable EFT framework for describing the structure and electromagnetic response of two-neutron halo systems.

Reference

- [1] M. Hongo, D. T. Son, Phys. Rev. Lett. 128, 212501 (2022), <https://doi.org/10.1103/PhysRevLett.128.212501>
[2] D. B. Costa, M. Hongo, D. T. Son, Phys. Rev. C 112, 014001 (2025), <https://doi.org/10.1103/lps3-g3tp>

Nov. 4th(Tue), 2025 13:30 ~
RIBF Large Meeting Room, 2 floor



* The talk will be given in English language.
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