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E1 strengths of two-neutron halo nuclei from halo effective field theory

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Due to their large spatial extension, two-neutron halo nuclei display a significant enlargement in the lowenergy E1 strength distribution parameterizing the Coulomb dissociation cross section. Thereby the E1strength is an important observable for halo nuclei, and by comparing theoretical calculations with experimental data, we can test our understanding of these exotic nuclear systems.

In this talk, I will present results from halo effective field theory (EFT) for the E1 strength distribution of the two-neutron halo nucleus ¹¹Li [M. Göbel et al., Phys. Rev. C 107, 014617 (2023)]. The distribution is obtained based on a three-body description of the ¹¹Li ground state via Faddeev equations. Final-state interactions (FSIs) subsequent to the E1 breakup are taken into account using a newly developed scheme allowing for the perturbative inclusion of multiple FSIs while conserving unitarity. This method uses the Moller scattering operators.

The calculations indicate that neutron-neutron FSI is the dominant FSI. Comparison with experimental data from RIKEN [T. Nakamura et al., Phys. Rev. Lett. 96, 252502 (2006)] shows good agreement within the EFT's uncertainty bands. Moreover, we also compare our approach with theory work by Hongo and Son [M. Hongo, D. T. Son, Phys. Rev. Lett. 128, 212501 (2022)], which employed different assumptions about the ¹¹Li halo. Finally, the *E*1 strength of ⁶He in Halo EFT will be discussed.

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