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Electric properties of one-neutron halo nuclei in Halo EFT[1]
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— We exploit the separation of scales in weakly-bound nuclei to compute E2 transitions and electric radii in a Halo EFT framework. The relevant degrees of freedom are the core and the halo neutron. The EFT expansion is carried out in powers of R_{core}/R_{halo}, where R_{core} and R_{halo} denote the core and halo radius, respectively. We include the strong s-wave and d-wave interactions by introducing dimer fields. The dimer propagators are regulated by employing the power-law divergence subtraction scheme and matched to the effective-range expansion in the respective channel. Electromagnetic interactions are included via minimal substitution in the Lagrangian. We demonstrate that, depending on the observable and respective partial wave, additional local gauge-invariant operators contribute in LO, NLO and higher orders. Finally, we present the modifications needed for the extension of our work to higher partial-wave bound states and discuss the consequences for universality in such systems.

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