Abstract Submitted
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Halo EFT treatment of 6He up to NLO ARBIN THAPALIYA, DANIEL PHILLIPS, Ohio Univ — Halo nuclei exhibit separation of scales and are therefore amenable to an Effective Field Theory (EFT) description. In Halo EFT, ^{6}He can be thought of as a tight ^{4}He (α) core surrounded by two loosely bound neutrons (n), hence it constitutes an effective Borromean three-body system. The valence neutrons of ^{6}He interact with the α-core predominantly through a p-wave ($^2P_{3/2}$) resonance while the two neutrons are in relative s-wave ($^1S_0$) resonance. The leading order (LO) Halo EFT calculations using momentum-space Faddeev equations pertinent to such a treatment of bound ^{6}He were carried out by Ji et al. in Phys. Rev. C **90**, no. 4, 044004 (2014). As an extension to that work, we are investigating ^{6}He up to NLO within Halo EFT. In this talk, I will demonstrate how the NLO piece of the $^1S_0$ nn dimer propagator, the NLO piece of the $^2P_{3/2}$ $n\alpha$ dimer propagator and the contact $n\alpha$ vertex in the $^2S_{1/2}$ channel become important at NLO in the three-body problem. I will show the diagrams that contribute to the NLO three-body t-matrix and discuss their divergences and renormalization.

Arbin Thapaliya
Ohio Univ

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