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Towards robust constraints on nuclear effective field theory from lattice QCD

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In this talk I will discuss several new results from the NPLQCD Collaboration that combine lattice QCD results on (hyper)nuclear systems at unphysical pion masses together with nuclear effective field theories. Two-baryon channels with strangeness 0 to -4 are analyzed, with findings that point to interesting symmetries observed in hypernuclear forces as predicted in the limit of QCD with a large number of colors. Also, several matrix elements of light nuclei are studied. The tritium axial charge, related to the Gamow-Teller matrix element, and the longitudinal momentum fraction of ^3He that is carried by the isovector combination of u and d are extracted and extrapolated to the physical point. For this latter case, it can be seen how including lattice results to experimental determinations can have imminent potential to enable more precise determinations and to reveal the QCD origins of the EMC effect.

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