

New lattice interaction and the spectrum of light and medium mass nuclei

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We present a new lattice formulation of chiral effective nuclear force with simpler decomposition into partial waves. With these new interactions the process of fitting to the empirical-observed scattering phase shifts is simplified, and the resulting lattice phase shifts are more accurate than those in previous studies. We present results for neutron-proton system up to next-to-next-to-next-to-leading order with lattice spacings of 1.97 fm, 1.64fm, 1.32fm and 0.99fm. We also present the new lattice results for the spectrum of the light and medium mass nuclei calculated with these new interactions

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