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An accurate relativistic chiral nuclear force

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Nucleon-nucleon interaction, or nuclear force, is the crucial input for ab-initio calculation of modern nuclear physics. It plays a fundamental role in understanding all nuclear structure and reaction phenomena. Nuclear force is the residue of strong interaction among nucleons, including protons and neutrons, which are bound into a large variety of nucleus of diverse nature depending on the number of protons and neutrons, known as Chart of Nuclides. So far, three approaches are widely accepted when dealing with this issue: phenomenological nuclear force, chiral nuclear force and lattice quantum chromodynamics. In the present talk, we construct relativistic chiral nuclear force up to next-to-next-to leading order based on covariant chiral effective field theory, the results of which are in good agreement with experimental data.

Primary author: LU, Junxu (北京航空航天大学)

Co-authors: Dr XIAO, Yang (Beihang University); Dr WANG, Chunxuan (Beihang University); GENG, Li-Sheng

Presenter: LU, Junxu (北京航空航天大学)

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