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Roy-Steiner-equation analysis of pion-nucleon scattering

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A precise understanding of low-energy pion-nucleon interactions is central for many areas in nuclear and hadronic physics, ranging from the scalar couplings of the nucleon to the long-range part of two-pion-exchange potentials and three-nucleon forces in Chiral Effective Field Theory. We present a calculation that combines the general principles of analyticity, unitarity, and crossing symmetry with modern high-precision data of hadronic atoms, leading to a phenomenological description of the pion-nucleon amplitude with unprecedented rigor and accuracy. Consequences for the pion-nucleon sigma-term and the matching to Chiral Perturbation Theory will be discussed.

Summary

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