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High-Precision Determination of the Pion-Nucleon σ Term from Roy-Steiner Equations

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Summary

We review the recent numerical solution of the Roy-Steiner equations for pion-nucleon scattering. One of the central results of this solution is a precise determination of the pion-nucleon σ term, based on a new, improved version of the Cheng-Dashen low-energy theorem that includes isospin-breaking corrections. In particular, we highlight the central role of the pion-nucleon scattering lengths for this determination, which are obtained experimentally from pionic-atom spectroscopy, and discuss possible ways to resolve the apparent tensions with lattice determinations of the σ term.

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