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A New Approach to the Effective Field Theory of the Two-Nucleon System with Perturbative Pions[1] JABER BALALHABASHI, Univ of Arizona — By using symmetries and separation of scales, effective field theory (EFT) offers model-independent results and systematic error estimation. However, understanding the physics of the two-nucleon system at low energies is still one of the major challenges for EFT, because inclusion of the pion as a degree of freedom makes renormalization complicated. Specifically for the ${}^1S_0$ channel, we will show how pions can be treated perturbatively for momenta even higher than the pion mass, by accounting for the zero of the scattering amplitude at the leading order of the EFT expansion. In the light of a new power counting and with the help of an auxiliary dimer field we obtain results in good agreement with the partial wave analysis of two-nucleon data. Possible lessons for the extension of these ideas to other channels will be discussed as well.

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