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Hadronic parity violation in pionless effective field theory
MATTHIAS SCHINDLER, University of South Carolina — The weak interaction between quarks induces a parity-violating component in the low-energy interaction between nucleons. Due to the nonperturbative nature of QCD at these energies, an understanding of how the weak quark-quark interactions manifest themselves in nucleon interactions remains elusive. Few-nucleon experiments utilizing polarized neutrons are being performed at the SNS, NIST, and other neutron facilities to map out this weak component of the nuclear force. I will describe a theoretical program to analyze and interpret the obtained data based on effective field theory. This approach allows for a systematic and model-independent description of few-nucleon observables. Results for parity-violating observables in the two- and three-nucleon sectors will be presented, including a discussion of the relevance of parity-violating three-nucleon interactions. Recent progress in the application of effective field theory methods in few-nucleon systems will allow us to extend these calculations to observables involving four and more nucleons.

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