Abstract Submitted
for the DNP16 Meeting of
The American Physical Society

Bayesian parameter estimation for chiral effective field theory[1]
SARAH WESOLOWSKI, RICHARD FURNSTAHL, Ohio State Univ - Columbus, DANIEL PHILLIPS, Ohio University, NATALIE KLCO, University of Washington
— The low-energy constants (LECs) of a chiral effective field theory (EFT) interaction in the two-body sector are fit to observable data using a Bayesian parameter estimation framework. By using Bayesian prior probability distributions (pdfs), we quantify relevant physical expectations such as LEC naturalness and include them in the parameter estimation procedure. The final result is a posterior pdf for the LECs, which can be used to propagate uncertainty resulting from the fit to data to the final observable predictions. The posterior pdf also allows an empirical test of operator redundancy and other features of the potential. We compare results of our framework with other fitting procedures, interpreting the underlying assumptions in Bayesian probabilistic language. We also compare results from fitting all partial waves of the interaction simultaneously to cross section data compared to fitting to extracted phase shifts, appropriately accounting for correlations in the data.

[1]Supported in part by the NSF and DOE

Sarah Wesolowski
Ohio State Univ - Columbus

Date submitted: 05 Jul 2016 Electronic form version 1.4