Abstract Submitted
for the HAW14 Meeting of
The American Physical Society

**Uncertainty Quantification for Nuclear Currents: A Bayesian $\chi$-EFT view of the Triton and $\beta^-$ Decay**[1] KYLE WENDT, University of Tennessee, Knoxville — Chiral Effective Field Theory ($\chi$-EFT) provides a framework for the generation and systematic improvement of model independent inter-nucleon interaction Hamiltonians and nuclear current operators. Within $\chi$-EFT, short and mid distance physics is encoded through a gradient expansion and multiple pion exchange parameterized by a set of low energy constants (LECs). The LECs are often constrained via non-linear least squares using nuclear bound state and scattering observables. This has produced reasonable low-energy descriptions in the past, but has been plagued by LECs that are unnaturally large. Additional issues manifest in medium mass nuclei where the $\chi$-EFT Hamiltonians fail to adequately describe saturation properties. It has been suggested that Bayesian approaches may remedy the unnaturally large LECs using carefully selected priors. Other analyses have suggested that the inclusion and feedback of nuclear currents into the constraints of the LECs may improve saturation properties. We combine these approaches using Markov chain Monte Carlo (MCMC) to study and quantify uncertainties in the Triton and the $\chi$-EFT axial-vector current, with the aim of providing a foundation for quantifying $\chi$-EFT uncertainties for weak processes in nuclei.

[1]This work was supported in part by the U.S. Department of Energy (DOE) under Grant Nos. DEFG02-96ER40963 (University of Tennessee), DE-SC0008499 (NUCLEI SciDAC collaboration), and by Oak Ridge National Laboratory. Oak Ridge National Laboratory is support

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Date submitted: 01 Jul 2014

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