

Abstract Submitted  
for the APR17 Meeting of  
The American Physical Society

**Uncertainty estimates for proton-proton fusion**<sup>1</sup> BIJAYA ACHARYA, Univ of Tennessee, Knoxville — We calculate the proton-proton fusion cross section using chiral effective field theory ( $\chi$ EFT) and perform a rigorous analysis of the associated uncertainties. The statistical errors in the low-energy constants, which are fitted to scattering and bound-state observables in the pion-nucleon, nucleon-nucleon, and few-nucleon sectors, are propagated to the calculated cross section. We also investigate the sensitivity of the fusion cross section to the high-momentum cutoff of the  $\chi$ EFT. We extract a value for the zero-energy  $S$ -factor using a polynomial extrapolant and analyze the errors associated with this procedure. Our result is compared to that of another  $\chi$ EFT calculation in which the wave functions were represented in a truncated Hilbert space with discrete basis states.

<sup>1</sup>Supported by the NSF under Grant Nos. PHY-1516077 and PHY- 1555030.

Bijaya Acharya  
Univ of Tennessee, Knoxville

Date submitted: 30 Sep 2016

Electronic form version 1.4