Abstract Submitted
for the APR20 Meeting of
The American Physical Society

Bayesian Analysis of Radiative Capture Reactions ^{3}He(α,γ)^{7}Be and ^{3}H(α,γ)^{7}Li PRADEEPA PREMARATHNA, GAUTAM RUPAK, Mississippi State University — In this work we use Bayesian analysis to estimate the parameters of radiative capture reactions ^{3}He(α,γ)^{7}Be and ^{3}H(α,γ)^{7}Li using effective field theory (EFT). EFT provides a model independent framework to describe physical systems as an expansion of low momentum scale over a high momentum scale. Here we consider two competing effective field theory power countings for the model comparison. In the first power counting, two-body currents contribute at leading order, and in the second power counting they contribute at higher orders. We estimate the parameters for the two power countings using most recent capture data and scattering data. For ^{3}He(α,γ)^{7}Be, the first power counting is favored if elastic scattering data in the incoming channel is considered in the analysis. Without constraints from elastic scattering data, both the power countings are equally favored. For ^{3}H(α,γ)^{7}Li, the first power counting is favored with or without constraints from elastic scattering data.

Pradeepa Premarathna
Mississippi State Univ

Date submitted: 07 Jan 2020 Electronic form version 1.4