Contribution ID: **147** Type: **Parallel**

Measurement of the Neutron Lifetime Using a Magneto-Gravitational Trap

Wednesday, 30 May 2018 16:10 (20 minutes)

Precision measurements of the free neutron lifetime τ_n, when combined with measurements of the axial vector coupling, can be used to test unitarity of the CKM matrix. Nonunitarity is a signal for physics Beyond the Standard Model (BSM). Sensitivity to BSM physics requires measurements of τ_n to a precision of 0.1 s. However, the two dominant techniques to measure τ_n (colloquially beam and bottle measurements) disagree by nearly 10 s. UCNτ is a neutron lifetime experiment using a magneto-gravitational trap and an *in-situ* neutron detector. Neutrons in this trap are not susceptible to loss on material walls as in previous bottle measurements. Additionally, the *in-situ* detector allows spectral monitoring of the trapped Ultracold Neutrons. In this talk, I will present our most recent result $\tau_n = 877.7 \pm 0.7_{(\mathrm{stat.})} + 0.4/-0.2_{(\mathrm{sys.})}$. I will also present Monte Carlo simulations of systematic effects in the experiment.

E-mail

nbcallah@indiana.edu

Collaboration name

UCNtau

Primary author: Mr CALLAHAN, Nathan (Indiana Univeristy)

Presenter: Mr CALLAHAN, Nathan (Indiana Univeristy)

Session Classification: Tests of Symmetries and the Electroweak Interaction

Track Classification: TSEI