Abstract Submitted
for the DNP20 Meeting of
The American Physical Society

Analysis of the high-statistics UCNτ dataset ERIC FRIES, Caltech, UCNτ COLLABORATION — There have been various measurements of the free neutron lifetime (τ_n) using either cold neutron beams, or ultracold neutrons (UCN) stored in a trap. There is a $\sim 4\sigma$ discrepancy in measured lifetimes between the two methods. The UCNτ experiment at Los Alamos Neutron Science Center uses an asymmetric magneto-gravitational trap to store UCN and counts the UCN remaining in the trap after various holding times to measure τ_n. During 2017 and 2018, the UCNτ collaboration gathered roughly seven times as much data as in the 2016 run cycle. Three independent analyses of these data are in progress. We expect our analyses to result in a measurement of τ_n with statistical uncertainty below 0.3 s and systematic uncertainty below $^{+0.2}_{-0.1}$ s. Here we present the methods used to extract τ_n and estimate the statistical uncertainty of the measurement, and outline the methods used to measure the dominant systematic effects.

Eric Fries
Caltech

Date submitted: 01 Jul 2020 Electronic form version 1.4