

Abstract Submitted
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A next generation neutron lifetime measurement based on UCN τ ¹ ALEXANDER SAUNDERS, Los Alamos Natl Lab, UCN τ COLLABORATION — The UCN τ experiment measures the free neutron lifetime by in situ counting of surviving ultracold neutrons after different storage times in an asymmetric magneto-gravitational storage volume. This experiment has acquired sufficient data for a measurement of the neutron lifetime with a statistical uncertainty of about 0.35 s and has demonstrated a systematic uncertainty of 0.28 s; it is expected to ultimately reach a total uncertainty of about 0.2 s. To achieve even better precision, the leading sources of uncertainty, which include counting statistics, microphonic heating of the stored neutrons, evolution of the neutron population in phase space, counting rate-dependent effects, and interactions with the residual gas in the storage volume, must be addressed. In this talk, we will discuss how to reduce these sources of uncertainty to achieve a total uncertainty on the neutron lifetime well below 0.1 s in the second generation Tau2 experiment.

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