

Abstract Submitted  
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**Revisiting the measurement of neutron lifetime using storage bottles**<sup>1</sup> PRAJWAL MOHANMURTHY, University of Chicago — Neutron lifetime is a critical parameter in the Standard Model. Its measurements using various techniques reveals serious tension. When ultracold neutrons are stored in material bottles, they can be lost to various processes:  $\beta$ -decay, absorption, and most important up-scattering on material walls. In the past, lifetime extraction by performing a disappearance measurement in material storage bottles, isolated the wall scattering losses, by comparing the decay curves from at least two storage chambers, with varying volume to surface-area ratios. This technique has been superseded by measurements performed with magneto-gravitational traps which avoids the wall scattering losses altogether. However, here we revisit the lifetime measurement in material storage bottle dominated by losses from wall scattering. Information about the neutron energy spectra, coupled with well characterized scattering loss coefficient of the wall materials, can be used to analyze neutron decay curve measured in a single storage chamber to extract neutron lifetime. Sensitivity of such an analysis, using the best available estimates of the energy spectra and scattering loss coefficients, upon the neutron lifetime will be discussed.

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