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Progress Toward a Redetermination of the Neutron Lifetime Through the Absolute Determination of Neutron Flux A. YUE, The University of Tennessee - Knoxville, G. GREENE, The University of Tennessee - Knoxville / Oak Ridge National Laboratory, M. DEWEY, D. GILLIAM, J. NICO, National Institute of Standards and Technology, A. LAPTEV, Los Alamos National Laboratory — The measurements of the neutron lifetime using "bottled" ultra- cold neutrons that claim the smallest experimental uncertainties are seriously discrepant with respect to each other. Given that the statistical contribution to their uncertainty is much smaller than the discrepancy, it is likely that one or more of these measurements suffers from an unidentified systematic effect. In the most precise cold neutron beam measurement of the lifetime which gives $\tau_n = (886.3 \pm 3.4)$ s, the largest uncertainty was attributed to the absolute determination of the capture flux of the neutron beam. A new direct measurement of the neutron lifetime flux monitor efficiency using an absolute "black" neutron detector could reduce this contribution to the uncertainty. A "black" detector that achieves 0.1 % statistical precision in several days of running has been put into operation at the NIST Center for Neutron Research. A 0.1 % calibration of the flux monitor efficiency will reduce the neutron lifetime uncertainty to approximately 0.25 % (2.2 s). The technique, the uncertainty budget, and the current status of the experiment will be discussed.

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