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A sub-second measurement of the neutron lifetime from the UCNτ experiment

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The UCNτ experiment has completed the first sub-second measurement of the neutron lifetime where the systematic corrections are smaller than the uncertainties. Using a bowl made of permanent magnets to trap the neutrons from below and gravity to confined the neutrons from above UCNτ eliminates almost all systematic corrections arising from material interactions. A novel *in situ* counting scheme for the surviving neutrons eliminates any systematics associated with transport to an external detector. The successful upgrade of the ultracold neutron source at the Los Alamos Neutron Science Center (LANSCE) has allowed UCNτ to perform several 1 s measurements in configuration designed to explore possible systematic effects. We will report on the combined analysis of five 1-2 second blinded measurements of the neutron lifetime performed during the 2016-2017 LANSCE run cycle, which resulted in a value of $\tau_n = 877.7 \pm (0.7)_{stat}(+0.3/-0.1)_{sys}$ in agreement with previous material bottle UCN storage experiments.