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A Gravito-Magnetic Trap for Measuring the Neutron Lifetime using Ultracold Neutrons KEVIN HICKERSON, California Institute of Technology, UCN LIFETIME COLLABORATION — There continues to be a significant discrepancy amongst the most precise measurements of the neutron lifetime. To help resolve this, the lifetime experiment at the Los Alamos Neutron Science Center (LANSCE) will use polarized ultracold neutrons (UCN) trapped by gravity in an asymmetric compound toroidal trap made of permanent magnets arranged in a high field gradient configuration called a Halbach array. Progress has been made on constructing the LANL experiment which removes marginally trapped UCN, a problematic systematic effect in previous measurements, with a compound toroid and a rippled multipole field that can quickly reduce the fraction of phase space of the trap that is quasi-bound, decreasing the probability that UCN escape or have material interactions during the lifetime measuring period.

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