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The science program at the Los Alamos ultra-cold neutron source

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In this talk, we present an overview of the science program at the Los Alamos spallation-driven solid-deuterium ultra-cold neutron (UCN) source and describe the performance of the source. Experiments in operation or development include the UCNA beta correlation measurements, the UCNTau neutron lifetime experiment, nEDM storage cell performance tests, and detector development for UCN and cold neutron measurements of the a, b, and B parameters in neutron beta decay (Nab, UCNB, and UCNb). The status of the experimental efforts and of the operation of the source will be presented. The source performance, including cold neutron density in the converter region, internal UCN density, and extracted UCN density, will be compared to Monte Carlo models and shown to perform as expected. The maximum delivered UCN density at the exit from the biological shield is 52(9) UCN/cc with a solid deuterium converter volume of 1500 cm3.

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