

Abstract Submitted
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Diamond-Like-Carbon Guides for use in Polarized Ultracold Neutron Transport: Production Improvements and Status RUSSELL MAMMEI, Virginia Polytechnic Institute and State University, UCNA COLLABORATION — The use of ultracold neutrons (UCN) to study fundamental parameters such as angular correlations in polarized beta decay and the neutron's electric dipole moment is well underway. Many of these experiments require non-magnetic/non-conductive UCN guides with high critical velocity, high specularity, and minimal depolarization. Experiments, performed at the Institut Laue-Langevin, have shown that pulsed laser deposited diamond-like-carbon (DLC) on the inside of quartz tubes is an exemplary guide technology to satisfy these requirements. Recent improvements to the production process, including an expanded cleaning procedure, a target rastering system, and the installation of monitoring diagnostics, have resulted in enhanced DLC guide quality. In addition to the guide production developments, a dedicated guide test system has been built to facilitate UCN transmission and lifetime studies. Using the Los Alamos National Lab UCN source, transmission and lifetime measurements of UCN guides fabricated with these improvements were made and will be presented.

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