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## Progress of the SNS Neutron Electric Dipole Moment Experiment

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A new experimental search for a permanent electric dipole moment of the neutron is under construction at the Spallation Neutron Source at the Oak Ridge National Laboratory. It makes use of a traditional technique, in which the Larmor precession frequency of a sample of neutrons held in a magnetic field is monitored for shifts upon the application of a strong electric field in parallel. The experiment is novel in that it uses ultracold neutrons produced via the superthermal process (the downscattering of cold neutrons by phonons) in a bath of superfluid helium-4 and subsequently held in the bath. Neutron precession is monitored via an optical system that detects scintillation light from the capture reaction of the neutrons on polarized helium-3 atoms in the bath. The projected sensitivity is about two orders of magnitude greater than in previous experiments, given the exceptionally high statistics, long integration times, and high electric fields anticipated with this approach.

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