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The ^3He injection test for the search of neutron electric dipole moment (nEDM) XIAOFENG ZHU, Duke University, NEDM COLLABORATION — The proposed nEDM experiment at the Spallation Neutron Source (ORNL) aims at a sensitivity of 10^{-28} e-cm. The experimental strategy is to form a three-component fluid of ultracold neutrons and ^3He atoms in a bath of superfluid ^4He . Polarized ^3He serves as a co-magnetometer and an ultracold neutron spin precessing frequency analyzer, using the spin-dependent nuclear reaction: $\vec{n} + ^3\vec{He} \rightarrow p + t + 764$ keV. The injection test described in this talk is to study methods of injecting polarized ^3He from an Atomic Beam Source (ABS) into the superfluid ^4He and demonstrate that the polarization loss is acceptable for the nEDM experiment. In this presentation, I describe the design of the magnet system, a pulsed NMR system for polarization measurement, and cryogenic issues associated with the injection test apparatus.

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