Abstract Submitted
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A Magnetic Field Mapper for the Test Apparatus of the nEDM experiment at Los Alamos National Laboratory VUK MIODRAG[1], Valparaiso University, NEUTRON TEAM[2] — The LANL neutron Electric Dipole Moment (nEDM) experiment is an effort to set a sensitivity limit of a few 10^{-27} $e\bullet$cm on the electric dipole moment of the neutron, an order of magnitude smaller than the current limit. This measurement makes use of Ramsey's method of separated oscillatory magnetic fields. In a prototype test apparatus based on a small magnetically shielded room (MSR), ultra-cold neutrons precess in a magnetic field produced by solenoid. The magnetic field must be spatially uniform enough for a neutron dephasing time longer than the neutron storage time, such that the Ramsey fringes are well-resolved by the test apparatus. In order to measure the magnetic field precisely, a magnetic field mapper was designed within the MSR. The mapper itself is a carriage-mounted fluxgate controlled by multiple programs and a microcontroller, thus allowing the fluxgate to map desired areas within the MSR. Results of magnetic field measurements inside the apparatus, before and after degaussing the MSR and with and without the solenoid, as well as the design of the mapper will be presented.

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