Abstract Submitted
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Magnetic field homogeneity for neutron EDM experiment[1] MELISSA ANDERSON, University of Winnipeg — The neutron electric dipole moment (nEDM) is an observable which, if non-zero, would violate time-reversal symmetry, and thereby charge-parity symmetry of nature. New sources of CP violation beyond those found in the standard model of particle physics are already tightly constrained by nEDM measurements. Our future nEDM experiment seeks to improve the precision on the nEDM by a factor of 30, using a new ultracold neutron (UCN) source that is being constructed at TRIUMF. Systematic errors in the nEDM experiment are driven by magnetic field inhomogeneity and instability. The goal field inhomogeneity averaged over the experimental measurement cell (order of 1 m) is 1 nT/m, at a total magnetic field of 1 microTesla. This equates to roughly 10ˆ{-3}homogeneity. A particularly challenging aspect of the design problem is that nearby magnetic materials will also affect the magnetic inhomogeneity, and this must be taken into account in completing the design. This poster will present the design methodology and status of the main coil for the experiment where we use FEA software (COMSOL) to simulate and analyze the magnetic field.

[1]Natural Sciences and Engineering Research Council

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