Precision magnetic field characterization for a neutron electric dipole moment search

MICHAEL MILLER, University of British Columbia, UNIVERSITY OF BRITISH COLUMBIA ENGINEERING CAPSTONE TEAM TEAM, TUCAN COLLABORATION, TRIUMF COLLABORATION — A non-zero neutron electric dipole moment (nEDM) violates CP-symmetry and is thus closely related to the Baryon Asymmetry in the Universe. It is the goal of the TUCAN collaboration to search for an nEDM with a sensitivity of \(10^{-27}\text{ecm}\). This experiment is conducted using ultracold neutron (UCN) spectroscopy. A static magnetic holding field of the art harmonic polynomial magnetic field decomposition is adapted as states of the system to gain improved insight into the role magnetic field inhomogeneities play for systematic uncertainties on the path towards an improved nEDM search sensitivity.

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