Abstract Submitted
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Investigation of a ^{129}Xe magnetometer for the Neutron Electric Dipole Moment Experiment at TRIUMF[1] MICHAEL LANG, University of Manitoba and TRIUMF, NEDM AT TRIUMF COLLABORATION — A non-zero neutron electric dipole moment (nEDM) would signify a previously unknown source of CP (or T) violation. New sources of CP violation are believed to be required to explain the baryon asymmetry of the universe. Employing a newly developed high-density UCN source, an experiment at TRIUMF aims to measure the nEDM to the level of 10^{-27} e·cm in its initial phase. Precession frequency differences for UCN stored in a bottle subject to parallel and anti-parallel E and B fields signify a permanent nEDM. Magnetic field instability and inhomogeneity, as well as field changes resulting from leakage currents (correlated with E fields) are the dominant systematic effects in nEDM measurements. To address this, passive and active magnetic shielding are in development along with a dual species (^{129}Xe and ^{199}Hg) atomic comagnetometer. Simultaneously introducing both atomic species into the UCN cell, the comagnetometer can mitigate false EDMs. ^{199}Hg precession will be detected by Faraday rotation spectroscopy, and ^{129}Xe precession will measured via two-photon excitation and emission. The present comagnetometer progress will be discussed, with focus on polarized ^{129}Xe production and delivery.

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