

# High precision magnetometry requirements for the search of the electric dipole moment of the neutron

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The TRIUMF Ultra-Cold Advanced Neutron (TUCAN) collaboration is currently developing a new ultra-cold neutron (UCN) source for the neutron electric dipole moment (nEDM) search experiment. Finding a nonzero nEDM, or improving its current upper limit will shed light on the baryon asymmetry of the Universe (BAU) - given that any measurable nEDM violates CP-symmetry which is also a crucial ingredient of BAU. The TUCAN goal is to reach a sensitivity of  $1 \times 10^{-27} \text{ e} \cdot \text{cm}$ .

This requires extreme magnetic field control: UCN will undergo spin precession even in a low magnetic field ( $\sim 1 \text{ } \mu\text{T}$ ). To maximize statistical sensitivity and control systematic uncertainties, the magnetic field must be controlled at a relative level of  $10^{-6}$  or better. This contribution will give an introduction to the applied techniques, which rely on tools such as passive magnetic shielding by high permeability material, scalar and vector magnetometry, magnetic field manipulation coils, and non-magnetic field mapping robots.

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