

## Ultra cold neutrons at TRIUMF: TUCAN and the neutron electric dipole moment experiment

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The TRIUMF Ultra Cold Advanced Neutron (TUCAN) collaboration seeks to measure the neutron electric dipole moment (EDM). A non-zero value of the neutron EDM violates CP symmetry. Searching for this elusive quantity can reveal information about the matter-antimatter asymmetry of our Universe. The TUCAN collaboration intends to improve the current upper limit on the neutron EDM by one order of magnitude and push into the  $10^{-27}$  e.cm sensitivity regime. During a neutron EDM measurement, electric and magnetic fields are applied and the spin precession of polarized neutrons is observed.

Ultra-cold neutrons (UCN) are suitable for this experiment as they can be trapped and stored for several minutes. However, the sensitivity of many of these measurements is presently limited by the intensity of existing UCN sources. TUCAN is building a new high-intensity UCN source at TRIUMF, in which UCN are produced by a neutron spallation target driven by TRIUMF's proton cyclotron and cooled by a combination of thermal moderators and super-fluid  $^4\text{He}$  converter. The trapped UCN will be used to search for the neutron EDM using Ramsey's technique of separated oscillatory fields. This presentation will give an overview of neutron EDM measurement techniques, the UCN source, and development of experimental apparatus at TRIUMF.

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