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(G*) The Spin Flip Pulse in the TUCAN EDM Experiment

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The TRIUMF Ultra-Cold Advanced Neutron (TUCAN) collaboration is currently building a next-generation ultra-cold neutron source, with a neutron electric dipole moment (nEDM) measurement as the flagship experiment. The nEDM measurement is based on the Ramsey method of separated oscillating fields to measure the precession frequency of the neutron in combined magnetic and electric fields. The Ramsey method involves the pulsed application of an oscillating magnetic field to produce a $\pi/2$ flip of the neutron spins. This talk presents studies of the magnetic field pulse in the nEDM experiment using finite element simulations, with a focus on the suppression and inhomogeneity of the field caused by eddy currents. Further Monte Carlo simulations of the neutron spins are used to optimize the timing of the pulse and simulate the expected behaviour of the neutrons in the full Ramsey measurement.

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