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Magnetic Holding Field Requirements for UCN Precession in the TUCAN EDM Experiment

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The TUCAN EDM experiment aims to measure the neutron electric dipole moment (EDM) to a precision of 1×10^{-27} $e$cm, by making a precise measurement of the neutron precession frequency change in a parallel magnetic and electric field when the eletric field direction is inverted. To make this measurement a coil will be used to provide a homogeneous precession magnetic field of $B_0 = 1$ μT inside a magnetically shielded room. To maintain the ultra cold neutron polarization during the measurement cycle a very high magnetic field uniformity is required. I will describe the coil design, and how we plan to meet the magnetic requirements by being able to adjust the coil placements to submillimeter precision.

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