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Design and Testing of a Magnetic Shielding Enclosure for Testing Spin Transport Magnets for the SNS nEDM Experiment[1] MARK MCCREA, University of Kentucky, SNS NEDM COLLABORATION COLLABORATION — The SNS nEDM Experiment aims to measure the neutron electric dipole moment to a sensitivity of order $10^{-28} e \cdot cm$. A series of magnets are being developed to transport polarized helium-3 from an atomic beam source outside the external magnetic shielding to its interior which has a uniform 30 mG magnetic field created by a rectangular solenoid. A pair of modified cosine theta coils are being developed to maintain the internal magnetic field uniformity through the 62 cm diameter opening in the magnetic shielding the polarized He-3 passes through. Once inside the shielding the polarized He-3 will be accumulated in a storage volume before being moved into the measurement cell where it will be used as a comagnetometer during the nEDM measurement. To aid in the magnet development a two layer magnetic shielding enclosure composed of high permeability metal alloys has been designed that will provide a similar magnetic environment to the full scale apparatus. I will describe the simulation, design and testing of this shielding enclosure.

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