

Abstract Submitted
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Magnetic Shielding Design and Optimization for NuDot SARAH VICKERS, University of North Carolina at Chapel Hill, NUDOT COLLABORATION — NuDot is the most recent prototype in the development of background reducing methods for neutrinoless double-beta decay. The aim is to be able to identify the direction of electrons moving through the scintillator fluid from the timing of Cherenkov light. The experiment is a half-ton prototype which contains a sphere of 210 8" and 2" photo-multiplier tubes to detect the decay events within the sphere. Each of these PMTs are sensitive to the presence of any magnetic field, including that of the Earth. This past summer, I worked to design a set of electromagnets to cancel out the components of the Earth's Magnetic field (EMF) to ensure optimal performance of the PMTs. A set of two coils will make this possible, one horizontal and one vertical. Each is a different coil design, the vertical being a variably-pitched solenoid and the horizontal a set of two square Helmholtz coils. Together, they reduce the overall magnetic field to below the 0.1 EMF threshold at which the PMTs will operate at 99

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