

Abstract Submitted
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Field modeling for the aCORN electrostatic mirror MICHAEL MENDENHALL, NIST - Natl Inst of Stds & Tech, ACORN COLLABORATION — The aCORN experiment measures the angular correlation between the electron and neutrino emitted in free neutron beta decay, via an electron-proton momentum correlation asymmetry. This method relies on a highly uniform electric field to direct protons' longitudinal momentum towards a detector, while leaving transverse momentum unchanged. Deviations from ideal field uniformity require a significant correction and corresponding systematic uncertainty on the experimental result. Production of a uniform field is complicated by the requirement that the mirror region be mostly transparent to protons, leading to a design with a thin wire grid endcap. This talk describes evaluation of the aCORN electric field uniformity systematic; in particular, electrostatic field modeling near thin wire grids. Finite-element numerical calculations are compared to analytical approximations to build intuition and confidence about modeling this multi-length-scale configuration.

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