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Electrostatic Simulations of the XENON-10 Dark Matter Detector[1] ROMAN GOMEZ, Rice University, XENON COLLABORATION — We describe electrostatic finite element simulations that characterize the electrical fields present in the dual-phase chamber at the operating voltages. These simulations were used to minimize field inhomogeneities in the liquid and gas phases of the detector. Among the effects to be minimized are the fluctuations in gas-phase scintillation related to the relative orientation of the mesh electrodes and charge loss in the liquid-phase. In the current detector configuration, charge loss occurs only in small regions of the sensitive volume, limited to either very low z-coordinates (0.9 mm above the cathode) or large radii (up to 2.2 mm from the edge). This radial loss decreases with increasing z-coordinate. A detailed discussion of the obtained results will be presented.

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Roman Gomez
Rice University

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