

# Asymmetric Electrostatic Radiation Shielding for Spacecraft<sup>1,2</sup>

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**Abstract**—The physics of the radiation shielding problem possess several asymmetries which may be exploited in electrostatics to obtain nearly isotropic protection without radial symmetry in the fields, a concept that has been overlooked in previous studies. Electrostatic shielding is advantageous because it solves the problem of secondary radiation generated in passive shields and allows passive shields to be smaller and more directional. This paper presents the results of computer simulations for a linear quadrupole configuration to demonstrate shielding effectiveness for protons and high-Z, high-energy particles, while at the same time driving away thermal electrons. The study indicates that this shielding method is nearly feasible with existing technology, and only modest gains may be needed to make it a reality.

<sup>1</sup>

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<sup>2</sup>

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