

Design and Computer Optimization of a Top-hat Electrostatic Analyzer for KAISTSAT-4

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A spherical top-hat electrostatic analyzer (ESA), which is being developed for space plasma analysis on the KAISTSAT-4 mission, is discussed. A top-hat analyzer is a specific design approach for achieving particle acceptance over a full 360° in the plane of acceptance. Extensive three-dimensional particle tracing simulations have been performed to select optimal dimensions for the analyzer, given a particular top-hat angle. We present the analyzer properties, especially, the geometric factors and the angular resolutions. This study affirms the large geometric factor of the analyzer and the very fine azimuthal angular resolution possible with the analyzer.