

TOP HAT ELECTROSTATIC ANALYSER WITH ENHANCED FEATURES FOR IN-SITU PLASMA STUDIES

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Top hat type electrostatic analysers provide an elegant solution for measurements of low energy electrons and ions in space plasmas and are being considered for a number of future missions. Most of these missions have two important requirements, a large dynamic range and a field-of-view close to 4π . A number of solutions have been implemented to address these, usually consisting of multiple sensors on spinning spacecraft or sensors coupled to bulky actuators. In recent times however, electrostatic techniques have been developed providing significantly lower resource solutions. In this paper, we present details of a prototype instrument that has been developed incorporating additional electrodes addressing both requirements. The electrodes consist of a pair of electrostatic deflector plates, similar to, for example, the PEPE instrument on Deep Space 1, increasing the field of view to approximately $\pm 40^\circ$ in elevation, and a novel “top-cap” electrode which modifies the energy band pass of the analyser to reduce the instrument geometric acceptance by more than an order of magnitude. Preliminary results of the performance of the two electrostatic systems will be presented and implications of performance modifications in different operational scenarios discussed.

Electrostatic analyser, plasma, instrumentation

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