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A micro-fabricated, low resource, electrostatic plasma analyser concept

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Abstract

Electrostatic Plasma analysers have generally evolved from using cylindrical plate instruments (such as the ion spectrometer on Mariner 2) to spherical plates (such as the IMP plasma probe) to the "top hat geometry" (first flown on the AMPTE IRM satellite). The continued trend is towards smaller, lower resource instruments with improved performance [1].

Due to the limitations of micro-fabricating spherical geometries, MSSL are currently investigating a modified cylindrical geometry for developing miniaturised plasma instruments. We present here a design concept based on this which is potentially capable of analysing both electrons and ions at multiple energies simultaneously.

A prototype device based on this concept has been fabricated (figure 1). Preliminary test results from the device will be presented and compared with results from electron optic simulations.

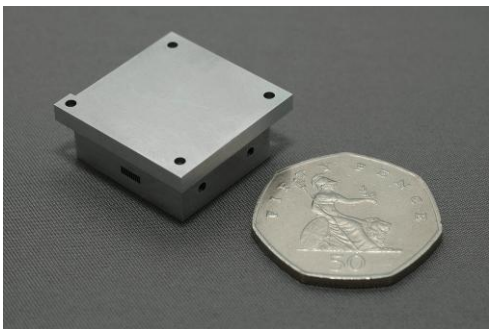

Figure 1: Prototype analyser head

Reference

[1] Funsten, H.O. and McComas, D.J. (1998) *Measurement Techniques in Space Plasmas -- Particles,* 157-167.