

HIGH-RESOLUTION BEAM-PROFILE MEASUREMENTS WITH A FARADAY-CUP ARRAY

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Abstract

The division of extraterrestrial physics at the University of Kiel is establishing a solar wind and supra-thermal particle laboratory which will be used mainly for three reasons: the calibration of space instruments dedicated to measure the solar wind and/or supra-thermal particles, the research of space weathering of dust particles and to study fundamental plasma physics. The laboratory will be able to generate a well-defined and highly charged ion beam at energies from 1 to 450keV/q. Both, calibration of space instruments and dust particle bombardment, need accurate values for the main beam parameters such as current, position, and profile. While the total current is measured by a single Faraday cup (FC), position and profile of the ion beam are acquired by an array of 44 tiny (0.3 mm diameter) Faraday-Cups (FCA) moving through the beam. This allows high resolution of beam current and position, as well as high durability since beam-currents from several hundred pA to a few mA and an incident beam power up to 40W are expected. Here, we present the basics of the detectors hard- and software design in addition to some first results of measurements.

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