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Zoom meeting B ：11/4 PM2 （15:45-17:30）
16:15-16:30

Experimental results on performance of an engineering model of a “double-shell" type of electrostatic plasma particle analyzer

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In these few decades, the demonstrative space plasma physics communities in the world have been conducting the intensive research and development activities for the instrumental miniaturization because compact and lightweight sensors are required for installation on micro/small satellites and cubesats in ongoing and future space exploration missions. We, therefore, have also been leading the designs and developments of several types of electrostatic plasma particle analyzers providing us with cutting-edge in-situ observational results. Recently, some novel types of space plasma instrument capable of simultaneous measurements of low-energy(less than a few tens of keV) electrons and ions with a single sensor head are being designed to cover a wide field-of-view(FOV), i.e., a full planar FOV similar to that of the prevailing top-hat type or a hemispheric FOV referring to the case of the "SELENE-PACE" analyzers, and the fabrication of the first engineering model succeeded for experimental performance tests in our electron/ion beamline facility of ISEE, Nagoya Univ. In these development activities for evolving in-situ observations of the space plasmas, the most significant viewpoint is to realize completely simultaneous measurements of electrons and ions over wide FOVs in one sensor head with a unique electrostatic energy analysis configuration for charged particles. Two separate/independent electrostatic field distributions, produced in our “double-shell" structure based on the top-hat type configuration by one high-voltage supply unit, are individually applied for electron/ion energy analyses. In the case of the engineering model reported in this presentation, the analyzer constant, the ratio of the measured particle energy to the applied voltage, is approximately four, and the full planar FOV is achieved. According to the data by the two-dimensional position-sensitive detection system, the experiments on the energy/angular analyses show good agreements with our numerical design. Since we use the electron and ion beams for the realistic space measurement situation in the actual performance tests, the detailed characteristics of the double-shell electrostatic energy analyzer can be obtained for the further improvements. These experimental results will be given here for investigation and discussion.