Development of a plasma particle sensor calibration system using high energy ion and electron beam line

Keiichi Ogasawara[1]; Masafumi Hirahara[2]; Tomoki Yanagimachi[3]; Kazushi Asamura[4]; Takeshi Takashima[4]; Nobuko Fujikawa[5]

[1] Rikkyo Univ.; [2] Department of Physics, Rikkyo University; [3] Faculty of Sci., Rikkyo Univ; [4] ISAS/JAXA; [5] PSSC/NCKU

A calibration system for satellite and rocket-borne plasma particle instruments which enables high energy (50-150 keV) ion and electron beam line is being developed in Rikkyo University. This system consists of ion and electron source, ExB mass spectrometer, beam expander, beam accelerator, drift tube and 3-axis turnable with x-stage in the main chamber. Some kinds of neutral gas including N2, O, He, and H2 are introduced to ion source and ionized by an electron gun, then accelerated to an energy of 10 keV/q and passed to mass spectrometer. The mass spectrometer has a permanent magnet of 1 kG and cylindrical electrodes, which produces crossed electric and magnetic field to select desired mass species. Ion or electron beam are expanded by means of electric field oscillation and electrostatic lens, then accelerated up tp 150 keV by potential drop in accelerator tube. Drift tube has two slits whose position are adjustable and a 2 dimentional beam profile monitor. In the main chamber, 3-axis turntable with an X-stage is set.