International Session (Oral) | Symbol P (Space and Planetary Sciences) | P-CG Complex & General

[P-CG11_28AM1] Instrumentation for space science
Convener:*Ayako Matsuoka(Research Division for Space Plasma, Institute of Space and Astronautical Science, Japan Aerospace Exploration Agency), Ichiro Yoshikawa(The University of Tokyo), Chair:Ayako Matsuoka(Research Division for Space Plasma, Institute of Space and Astronautical Science, Japan Aerospace Exploration Agency), Ichiro Yoshikawa(The University of Tokyo)
Mon. Apr 28, 2014 10:00 AM - 10:45 AM  421 (4F)
This session will cover instrumentation and measurement techniques for the study of space science. We welcome contributions discussing newly designed instruments, and mission oriented instruments for satellites / sounding rockets already in space or near launch as well as the ground based instruments. Status reports on the space missions are also welcome. This is the international session. We encourage the contributions especially from the Asian countries based on their own space missions.

10:30 AM - 10:45 AM

[PCG11-P01_PG] Effects of finite electrode area ratio on Langmuir probe measurement

3-min talk in an oral session

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Keywords: Langmuir probe, finite electrode area ratio, electrode surface contamination, pico/nano-satellite, electron temperature, electron density

Langmuir probe(LP) is a widely used instrument for measuring electron density and temperature on satellites and rockets. Recently pico- and nano- satellites have become more popular, when the surface area of satellite is similar to the probe, the effects on LP measurement due to limited satellite surface area need to be considered, and these effects may cause LP measurement inaccurate. We have investigated the effect of satellite surface area, satellite and probe contamination and LP sweeping frequency in laboratory. Also we have found that the satellite and probe voltage will decrease when a large quantity of electrons are attracted by probe voltage and the contamination effect of satellite surface becomes major. In summary, a solution to these problems is suggested.