

Effects of finite electrode area ratio on Langmuir probe measurement Effects of finite electrode area ratio on Langmuir probe measurement

CHEN, Wen-hao^{1*}; JIANG, Guo-hsiang¹; HSU, Yu-wei¹; FANG, Hui-kuan³; OYAMA, Koichiro²; CHENG, Chio²
CHEN, Wen-hao^{1*}; JIANG, Guo-hsiang¹; HSU, Yu-wei¹; FANG, Hui-kuan³; OYAMA, Koichiro²; CHENG, Chio²

¹Institute of Space and Plasma Sciences, National Cheng Kung University, ²Plasma and Space Science Center, National Cheng Kung University, ³Department of Physics, National Cheng Kung University

¹Institute of Space and Plasma Sciences, National Cheng Kung University, ²Plasma and Space Science Center, National Cheng Kung University, ³Department of Physics, National Cheng Kung University

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.

キーワード: Langmuir probe, finite electrode area ratio, electrode surface contamination, pico/nano-satellite, electron temperature, electron density

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