

Calibration of Electron Temperature Probe on KITSAT-3

Young-Hoon Shin, Dae-Hee Lee, and Kyoung-Wook Min
SaTReC, KAIST
373-1 Kusong-dong, Yusung-gu, Taejon, 305-701, Korea

Electron temperature is one of the basic plasma parameters which are needed to understand many geophysical phenomena. Therefore, this has been measured since the early history of sounding rockets and satellites. In spite of the long history of measurements in space, electron temperature in the high latitude regions such as cusp, polar cap and the aurora oval was not sufficiently investigated. ETP (Electron Temperature Probe) is the one of the science payload named SENSE (Space ENvironment Scientific Experiment) on-board the KITSAT-3 and specially designed to measure accurately the electron temperature. The specific science objectives of ETP experiments are 1) to measure electron temperature in the high latitude regions, especially in the polar cap, 2) to study the anomalous heating found in the SAA, and 3) to find any relationships with other plasma parameters such as energetic particles and plasma waves. From the voltage difference between the floating potential of rf modulated probe and floating potential of non-modulated probe, electron temperature can be determined. By using the identical sensors for the two probes, we can effectively eliminate the contamination effects. The engineering model of the ETP was tested using plasmas generated in a large vacuum chamber at the Institute of Space Astronautical Science (ISAS) in Japan. We will present the method of the calibration and initial results.