Solid State Telescope on KAISTSAT-4

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The Solid State Telescope (SST) on-board the KAISTSAT-4 investigates plasma processes occurring in the low altitude auroral acceleration region. In this region the magnetic field aligned currents couple the global magnetospheric current systems to the high latitude ionosphere. Geomagnetic field lines can guide energetic electrons and protons from magnetosphere or magnetosheath down to Earth's atmosphere. Precipitating particles lose their energy via collisions with the neutral and ionize them at 80300 Km. Some atmospheric constituents can be excited to higher energy levels. This can lead to the formation of auroral light. The auroras during magnetospheric substorms and the great auroras during magnetospheric storms can create extremely impressive spectacles. These auroral particles play the key role in magnetosphere-ionosphere coupling. The particles in the intervening energy range, from just above solar wind plasma to 1MeV, are referred as suprathermal particles. These particles play a key role in the varied plasma and energetic particle phenomena observed to occur in the auroral oval and upstream from the Earths magnetosphere. The SST is designed specifically to make measurements of energetic electrons and ions in this energy range with simultaneous measurement of FIMS on the KAISTSAT-4. Two arrays, each consisting of a pair of double-ended semi-conductor telescopes each with two or three closely sandwiched passivated ion implanted silicon detectors, measure electrons and ions above 20KeV. One side of each telescope is covered with a thin foil which absorbs ions below 400KeV, while on the other side the incoming < 400KeV electrons are swept away by a magnet so electrons and ions are clearly separated. Higher energy electrons (up to ~1MeV) and ions (up to 11MeV) are identified by the two double-ended telescopes which have a third detector. The telescopes provide energy resolution of E/E ~ 0.3 and angular resolution of 22.5o 36o.