

ElectroStatic Analyzer (ESA) for KAISTSAT-4

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The electrostatic analyzer on the KAISTSAT-4 is designed to measure pitch-angle distributions of suprathermal auroral electrons with high sensitivity, wide dynamic range, good energy and angular resolution. These measurements support the scientific goal of the KAISTSAT-4 mission to understand the physical processes responsible for auroral particle acceleration and heating, and plasma instability. The instrument mounted on the top of spacecraft has 180 fields of view. Because the KAISTSAT-4 is the three axis stabilized satellite, ESA can observe magnetic field aligned particles during most auroral crossings. The analyzer serves as an electron spectrometer that obtains distributions of 32 energies at 8 angles every 180 milliseconds. Their standard energy ranges are 5 eV to 20 keV for electrons. The instrument electronics include MCP pulse amplifiers and counters, high voltage supplies, command/data interface circuits, and diagnostic test circuits. All data formatting, commanding, timing and operational control of the plasma analyzer instrument are managed by a microcontroller, 87C51.