Spectral Observation of FUV Aurora/Airglow by STSAT-1

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This study presents the results of FUV aurora and airglow observations made from the dual band FUV spectrograph, FIMS, on STSAT-1 operated at an altitude of 685 km. The bandwidths of FIMS are 900-1150 Å for the S-band with 2 Å spectral resolution and 1340-1750 Å for the L-band with 3 Å spectral resolution. The spectra observed for the diffuse and discrete auroras, the polar cap regions, and the daytime and nighttime airglow are compared. The auroral spectrum is also compared with the electron spectrum measured simultaneously on the same spacecraft. The observed intensities of discrete auroras were especially sensitive to the energies of the penetrating electrons in the long Lyman-Birge-Hopfield (LBH) band above 1600 A. On the other hand, the short LBH below 1500 A showed strong Schumann-Runge O_2 continuum absorption and the corresponding intensities were more or less the same regardless of the energies of the penetrating electrons. The daytime airglow showed various oxygen and atomic/molecular nitrogen lines while the 1356 oxygen line dominated the nighttime airglow. The results of limb scanning observation made for the daytime airglow will also be presented and compared with those of Atmospheric Ultraviolet Radiance Integrated Code (AURIC) simulations.