

Ground-satellite simultaneous observation of pulsating aurora

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Energy characteristics of the precipitating electrons responsible for the pulsating aurora were investigated by using the ground-based auroral observation at Syowa Station in 2003 and the data from the low-altitude satellite such as DMSP. Following results were obtained from the six cases of the simultaneous observation:

1. Energy flux in the higher energy range above 5~10 keV clearly increases at the time of the pulsation ON, in comparison with the OFF time.
2. Variation of the total energy flux is positively and inversely correlated with those of the average energy and total number flux, respectively, which suggests that the increase and decrease of the pulsating auroral emission intensity should be mainly caused by the increase and decrease of the average energy of the precipitating electrons. This result is consistent with the result obtained by the ground-based optical observation.

In future, we will investigate the variations of the electric field and magnetic field around the pulsation aurora by using the ion driftmeter and magnetometer data of the DMSP satellites, and we will also survey such simultaneous observations with other satellites, e.g. FAST, Cluster, and Geotail.