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Comparisons of electron energy flux derived from X-ray bremsstrahlung measurements and from a photochemical model for nitric oxide.

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The electron energy flux calculated by using a photochemical model of nitric oxide (NO) is adjusted to fit the NO density in the lower thermosphere measured by SNOE/UVS (Student Nitric Oxide Explorer/ Ultraviolet Spectrometer). This energy flux is compared to the electron energy flux derived from time-integrated X-ray bremsstrahlung measurements from Polar/PIXIE (Polar Ionospheric X-ray Imaging Experiment).

SNOE/UVS measured the NO density by observing the airglow spectral features of the NO gamma band on the dayside of the orbit. Since a significant part of the electron precipitation occurs on the nightside, we have accumulated the X-ray data in geographical boxes. This enables us to follow the total energy deposition over a specific area during the night and morning hours. This energy can be directly compared with the electron energy flux derived from the NO measurements. In this study comparisons are made for the beginning of several geomagnetic storm time events of 1998. Here we present data from March 21, 1998, and May 2, 1998. For these events the computer codes used to calculate the electron energy flux from PIXIE X-ray bremsstrahlung and from SNOE NO density are also compared.