

Spectral Characteristics of Low-Latitude Auroras Observed in Japan in 1999-2003

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We review observations of low-latitude auroras in Japan during the solar maximum period of 1999-2003. Nineteen events of low-latitude auroras during geomagnetic storms were identified. All of them were characterized by enhanced red (630.0 nm) emissions in the northern sky of Japan. In addition, some showed weak enhancements (about 10 R) of N₂⁺(1NG) (427.8 nm) as well, indicating precipitation of high-energy electrons or energetic heavy ions/neutral atoms. Intense (of more than 1 kR) green line emissions (557.7 nm) were often observed not only in the northern sky but also in the whole sky, suggesting the importance of coupling between storm-time neutral dynamics and chemistry in the mesosphere.