

Ion precipitation in the cusp for stably northward IMF: Seasonal dependence

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Plasmas are injected into the cusp through lobe reconnection when IMF is northward. Previous studies have shown that the flux of the cusp ion precipitation at the ionospheric heights tends to increase as the solar wind dynamic pressure increases. In order to quantify the solar wind control of the flux of the cusp ion precipitation and understand other key parameters for the ion precipitation for northward IMF, we examined ion precipitation data obtained by DMSP F16, F17, and F18 during three years. Our automated detection of the cusp ion precipitation took more than 500 events that occurred at higher latitudes than 78 MLAT during stably northward IMF. The result of the statistical analysis shows that the seasonal dependence of the cusp ion flux exists in addition to the solar wind parameter dependence. We discuss the result in terms of the dipole tilt angle effect and/or the effect of the solar illumination of the ionosphere.

Keywords: Cusp, ion precipitation, solar wind, northward IMF