

Effects of the Dipole Tilt on Dayside Magnetic Reconnection in the Earth's Magnetosphere for Northward IMF

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We have performed a high-resolution and time-dependent three dimensional MHD simulation of interaction between the solar wind and the Earth's magnetosphere when the dipole tilt, and B_y and B_z components of the IMF are simultaneously included in the whole volume of the simulation box. In present study, for the case of positive dipole tilt, and during the northward IMF ($B_z = 5$ nT, $B_y = 5$ nT), magnetic reconnection occurs at high latitudes in the northern dusk due to antiparallel field condition in the summer hemisphere for $B_y > 0$ and creates open field lines. The open field lines which are generated in the dusk sector and their feet are on the northern ionosphere, move from dusk to dawn in the dayside magnetopause and then come back to dusk in the tail. Tail reconnection successively occurs in the slant and elevated plasma sheet. The polar cap potential in dusk cell is larger than that the dawn cell in summer hemisphere. Moreover three-cell pattern appears in the northern ionosphere. On the other hand, the negative potential is comparable to the positive potential in winter hemisphere and the distorted three-cell pattern appears in the southern ionosphere. The open-closed boundary in the winter hemisphere appears at higher latitude than that in the summer hemisphere.