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# Dynamics of the Jovian Magnetosphere with the Dipole Tilt

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Jupiter's rapidly rotating magnetosphere differs greatly from the Earth's. At Earth magnetospheric dynamics primarily are driven by the solar wind. At Jupiter the magnetosphere is determined by a complex interaction between the atmospherically driven corotation, the plasma source in the Io torus, and the solar wind. This process is still not fully understood. In previous studies we have used a three-dimensional global magnetohydrodynamic simulation to investigate the response of Jupiter's magnetosphere to a northward turning of the interplanetary magnetic field (IMF) and found that plasmoids (magnetic O regions) were periodically ejected down the magnetotail. In this study we expanded our simulation study by including Jupiter's $10^{o}$ dipole tilt in the calculation.

We have examined three cases. First we investigated the effects of decreasing the magnitude of the IMF, then we investigated the effects of decreasing the solar wind dynamic pressure, and finally we investigated the effects of decreasing both the IMF and the pressure. The inclusion of the dipole tilt lead to the expected wave-like structure of the plasma sheet as the effects of the rotating dipole propagated into the magnetosphere. The dynamics of the magnetosphere become more complex than in the case with zero tilt.

Keywords: Jupiter; MHD simulation; magnetosphere; Dipole tilt

## References

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