Dependency of Mgnetic Reconnection to the Solar Wind and IMF in the Earth's Magnetosphere

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In the 3-dimensional global model of interaction between the solar wind and earth's magnetosphere, we have changed parameters of the solar wind and interplanetary magnetic field (IMF) to study what conditions control magnetic reconnection in the tail as well as at the dayside magnetopause. Moreover, it is proposed that the electric field component parallel to the magnetic field E||plays a crucial physical role. However we also examined the perpendicular component and J||by 3-dimensional MHD simulation.

The IMF and the solar wind density, velocity and pressure are given as parameters to examine the magnetic reconnection ratio. In this simulation, we changed IMF Bz component and solar wind velocity, Vx and calculated Ey component in the region where magnetic reconnection is occurring.