

A numerical simulation of magnetospheric response to a solar wind impulse (2): Development of the Main Impulse

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This report discusses a MI of a SC based on a numerical simulation by using a solar wind-magnetosphere-ionosphere coupled system. It is noted that a PRI is a magnetospheric response to a solar wind impulse without the ionosphere. The essential physical processes of a PRI are generation of a compressional signal in the magnetosphere and mode conversion from the compressional signal to an incompressible signal that carries a field-aligned current in a MHD fluid like the magnetospheric plasmas. On the other hand, a MI is a stage when the unbalanced magnetospheric disturbance and the ionospheric convection gradually match to each other. These two convections tends to have a self-consistent system that has the region 1 and region 2 field-aligned currents in a new steady state corresponding to the enhanced solar wind speed condition.