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Response of the Earth's magnetosphere to change of IMF Bz component

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It is known that plasma energy is transported from the solar wind to the Earth's magnetosphere, and IMF Bz component plays the most important role in the transportation through magnetic reconnection. Thus, it became clear that large magnetic storms in the magnetosphere are caused by CME with a southward IMF.

In contrast, high-energy electrons in the Earth's outer radiation belt are due to CIR (Co-rotating Interaction Region) which doesn't cause strong magnetic storms in contrast with CME. The characteristics of CIR are long duration of high-speed solar wind and fluctuations of IMF.

Thus we have executed a 3-dimensional global MHD simulation between the solar wind and earth's magnetosphere in order to study response of the magnetosphere to oscillations of the IMF Bz component. The configuration and dynamics of the magnetosphere depending on oscillations of the IMF are demonstrated.

Keywords: MHD, IMF, CIR