



Modelling magnetospheric Currents and their Effect on the near Earth magnetic Field

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Solar wind generated magnetospheric currents constitute a significant source to the magnetic field near the Earth surface. Most prominent and also most well described is the effect of the magnetospheric ring current, but also magnetopause currents, partial ring current and tail currents play a role. Least well describe is probably the long-distance effect of the high-latitude field-aligned currents.

Global MHD modelling constitutes a physics based approach to estimate magnetopause- and tail-currents, and is a particular useful tool for investigating how these currents vary with the solar wind parameters. Modelling of the long-distance effect of FACs, on the other hand, requires accurate mapping of the high latitude FAC patterns. We use a model run of the OpenGGCM performed at the Community Coordinated Modelling Center (CCMC) to estimate the 3D-distribution of magnetopause and tail currents, as well as FAC patterns estimated from ground and low altitude orbiting satellites. From these models we estimate the associated low- and mid-latitude magnetic disturbances using Biot-Savart integration. Focus is on the analysis of a typical storm from quiet times through ssc, storm main phase to the recovery phase.