



Comparison of the observations and global MHD simulations of interplanetary shock propagation through the Earth's magnetosphere

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Global MHD simulation of the interplanetary (IP) shocks, which interact with the magnetopause causing pressure pulses and launching various waves into the Earth's magnetosphere, shows comparison with the real observation, gives us additional data and fills data gaps. From our analysis of a couple of fast forward shocks it appears that the disturbance speeds are higher in the magnetosphere than in the solar wind and gradually increase from the magnetopause tailward. From the set of fast forward IP shocks we chose several examples for detail study of the shock/disturbance propagation from the solar wind into the magnetosphere, interaction with the MP, its movement, changing of the disturbance front and tracing the disturbance from the dayside to the nightside.

After previous detail study of the passage of two IP shocks through the magnetosphere we used the GUMICS-4 global MHD code to simulate the same event. The simulation is in good agreement with the observation and gives us a global characteristics of the whole process of shock/magnetosphere interaction. We resume advantages and disadvantages of the simulation model in the case of describing such dynamic events.