

## **GLOBAL ENERGY PARTITIONING: COMPARISON OF SPACECRAFT OBSERVATIONS AND A MHD SIMULATION**

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We investigate the global energy partitioning in a magnetohydrodynamic (MHD) simulation during Feb 18, 2004, when there was a good coverage of spacecraft observations in near-Earth space. Cluster spacecraft crossed the magnetopause into the magnetosheath, GOES measured the inner magnetosphere, while Geotail was observing the near-tail plasma sheet and Wind the far-tail regions. The event includes an interplanetary shock and a pair of substorms with associated plasmoid observations at Geotail and Wind.

We use a global MHD simulation GUMICS-4 to investigate the event using the actual solar wind parameters from the ACE spacecraft as input. The simulation outputs the plasma parameters in the near-Earth space including the magnetosphere and the ionosphere. We investigate the global energy partitioning in light of the substorm evolution in the GUMICS-4 simulation. The magnetospheric energy transfer is evaluated through the magnetopause. In the ionosphere we evaluate the energy associated with Joule heating and particle precipitation. We also identify a plasmoid flux tube in the simulation, present its topological evolution in time and calculate the energy carried away in its release. The foot points of the plasmoid flux tube are also identified using a maximum pseudoentropy method and mapped into the northern ionosphere along with other simulation parameters.

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