



## **Magnetopause reconnection in the Gumics-4 global MHD simulation**

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Global MHD simulation models are the present-day standard choice for modelling the entire magnetosphere and solar wind-magnetosphere-ionosphere coupling self-consistently. They are especially useful in estimating integrated quantities, such as the total flux of e.g. mass or energy through the magnetopause. In this study we use the Gumics-4 simulation code to investigate the features and the global role of reconnection on the magnetopause. We find that magnetic merging in the simulation is concentrated around the subsolar point for most IMF orientations. A three-dimensional topological definition for the magnetopause x-line is presented, and the x-line is shown to behave in a way which is consistent with the prediction of the component reconnection model. We then analyze quantitatively the effect of solar wind conditions on the reconnection rate and mass and energy flux into the magnetosphere, giving particular attention to their interdependence.