

太陽風とミニ磁気圏の相互作用 Interaction between solar wind and mini-magnetosphere

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Interaction between the solar wind and the mini-magnetosphere of dipolar magnetized objects is investigated by a three-dimensional hybrid simulation, which treats the ions as kinetic super particles via particle-in-cell method and the electrons as a massless fluid. The hybrid simulation is suitable for the study of the mini-magnetosphere which scale is the order of the ion Larmor radius of the solar wind ions at the magnetopause boundary, because the ion kinetic effects are important for its structure. In the northward interplanetary magnetic field (IMF) condition, the shape of the mini-magnetosphere is similar to a down-sized geomagnetosphere. However cusp reconnection twists the field lines over of the cusp region due to the Hall effects. In the southward IMF condition, patchy reconnection is generated in the dayside magnetopause boundary and generates plasmoids or Flux Transfer Events as large as a quarter of the magnetosphere. We will discuss the boundary structures of the mini-magnetosphere.

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