The structure of dayside magnetic reconnection layer

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We have performed a number of two-dimensional hybrid simulations (ion particle, charge neutralizing massless electron fluid) of the dayside reconnection layer. We will attempt to describe characteristic features obtained from our simulations, including the evolution of rotational discontinuities, which might serve as a guide to the observations of dayside magnetic reconnection.

Geotail satellite has frequently observed rotational discontinuities accompanied with fast plasma flows at the dayside magnetopause boundary layer, where magnetospheric and magnetosheath plasmas are mixed. These rotational discontinuities are considered to be an evidence of dayside magnetic reconnection. We have performed a number of two-dimensional hybrid simulations (ion particle, charge neutralizing massless electron fluid) of the dayside reconnection layer where the plasma density, temperature, and magnitude of magnetic field are different between magnetospheric and magnetosheath regions. We will attempt to describe characteristic features obtained from our simulations, including the evolution of rotational discontinuities, which might serve as a guide to the observations of dayside magnetic reconnection.