

Abstract Submitted
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Full particle-in-cell simulation study on solar wind interaction with a small scale magnetosphere TOSEO MORITAKA, HIDEYUKI USUI, TATSUKI MATSUI, Kobe University, Japan, JST/CREST “MAGNETO PLASMA SAIL” MULTI-SCALE SIMULATION TEAM — Solar wind interaction with a small magnetosphere comparable to or less than the ion inertial length is investigated by using full particle-in-cell simulation. Such micro-scale magnetospheres would be used for the next-generation interplanetary flight system called Magneto Plasma Sail. In the preliminary two dimensional simulations, magnetic reconnection takes place at the night side of the magnetosphere even in the northward IMF case and a typical signature of quadruple magnetic field is observed over the entire magnetosphere. A current density peak is formed inside the magnetosphere due to the electron backflow from the reconnection region, in addition to the induced current density at the front boundary layer where the solar wind momentum is primarily diverted. Based on the results of three dimensional simulations using nested grid system, detailed structure of the inner electron flow, its impacts on the solar wind interaction, and the resulting propulsion will be discussed.

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