

京コンピュータを用いた弱磁化小天体のグローバルブラソフシミュレーション Global Vlasov simulation of a small body with a magnetic anomaly with the K-computer

梅田 隆行^{1*}
UMEDA, Takayuki^{1*}

¹ 名古屋大学太陽地球環境研究所
¹Solar-Terrestrial Environment Laboratory, Nagoya University

The interaction between a plasma flow and a small dielectric body with a weak intrinsic global magnetic field is studied by means of a five-dimensional (5D) full electromagnetic Vlasov simulation with two configuration spaces and three velocity spaces. In the present study, entry processes of ions into the nightside wake tail are examined. The simulation result shows that the bow shock and the magnetopause are formed on the dayside. However, most of solar-wind ions are reflected at the dayside magnetopause and are picked up by the interplanetary magnetic field. Then, a small part of the reflected ions are taken into the deep wake tail near the body by the E cross B cycloid motion. The present result, in which the spatial resolution is low and the Debye-scale charge separation on the dayside surface is not solved, is obtained by using a recent cluster computer system. Currently we are performing a 5D high-resolution global Vlasov simulation by using the K-computer. The direct comparison between the low- and high-resolution runs would show importance of fully kinetic global simulations.

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