Abstract Submitted
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Multi-Hierarchy Simulation for Magnetic Reconnection – 2D Hierarchy-Interlocking Model[1] SHUNSUKE USAMI, RITOKU HORIUCHI, HIROAKI OHTANI, National Institute for Fusion Science, MITSUE DEN, National Institute of Information and Communications Technology — Toward the complete understanding of magnetic reconnection as a multi-hierarchy phenomenon, we have developed a multi-hierarchy simulation model which solves macro- and microscopic physics simultaneously and self-consistently. For this purpose, we pay attention to a hierarchical structure of magnetic reconnection phenomena, i.e. kinetic effects play crucial roles in the vicinity of the X point, while MHD model gives a good approximation as being away from the X point. Based on this feature, we divide a real space into macro- and microscopic domains and solve the physics in the macro- and microscopic domains with use of the MHD and PIC algorithms, respectively [1]. In 2009, with the hierarchy-interlocking model in the upstream direction, we had successfully performed multi-hierarchy simulations of magnetic reconnection. In order to apply our model to much wider systems, we have extended it to a 2D hierarchy-interlocking one, namely an interlocking in the upstream and downstream directions. In our presentation, we will show simulation results with 2D hierarchy-interlocking models and talk about the future prospect of our multi-hierarchy model.

[1] S. Usami, R. Horiuchi, H. Ohtani, and M. Den, Phys. Plasmas 20 (2013) 061208.

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