Development of Electromagnetic Particle Simulation Code in an Open System for Investigation of Magnetic Reconnection[1] H. OHTANI, R. HORIUCHI, NIFS, Jpn., Grad. Univ. Adv. Studies, Jpn., S. USAMI, NIFS, Jpn. — In order to investigate magnetic reconnection from the microscopic viewpoint, we have developed a three-dimensional electromagnetic particle simulation code in an open system (PASMO) [1]. For performing the code on a distributed memory and multi-processor computer system with a distributed parallel algorithm, we distributed only information of particles and did not decompose the domain in the previous PASMO code. However, in the case that the memory size on one node of computer is limited, the previous code could not be performed for large-scale simulation because all field data were duplicated on each parallel process. In order to overcome this problem, we decompose the domain, in which the field variable defined by three coordinates is distributed. The processor performs the field solver in the mapped domain, and carries out the particle pusher for the particles which exist in the domain. In this paper, we develop the open boundary condition with the domain decomposition algorithm and perform more large-scale particle simulations. We will discuss the performance of the new PASMO and the simulation results on the magnetic reconnection.

[1] H.Ohtani and R.Horiuchi: Plasma and Fusion Research, Vol.4, 024 (2009).

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