Developments of Electromagnetic Particle Simulation Code for Magnetic Reconnection Researches in Open System PASMO and Visualization Library VISMO[1] H. OHTANI, R. HORIUCHI, M. NUNAMI, S. USAMI, NIFS, N. OHNO, U.Hyogo — As the capabilities of computers are improved, the sizes of simulations become greater and greater. In this situation, we have some big issues. One of them is how to develop an efficient simulation code, and another is how to visualize the large data by the simulation. In order to investigate magnetic reconnection from the microscopic viewpoint, we develop a three-dimensional electromagnetic PIC 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 decompose three-dimensionally the simulation domain, and introduce the charge conservation scheme to exclude the global calculation, such as Poisson solver with FFT. In the visualization of the simulation data, we develop an in-situ visualization library VISMO [2] for the PIC simulation to carry out the visualization in tandem with the simulation on the same computers. The simulation code with VISMO generates image files instead of raw data. We will discuss the performance of the new PASMO and the simulation results visualized by VISMO on the magnetic reconnection.

[1] H.Ohtani and R. Horiuchi: Plasma and Fusion Research, Vol.4, 024 (2009). [2] N. Ohno and H. Ohtani: Plasma and Fusion Research, Vol.9, 3401071 (2014).

Hiroaki Ohtani
National Institute for Fusion Science