Database development of global Jovian magnetospheric MHD simulations for collaboration with observations

*Keiichiro Fukazawa[1], Tomoki Kimura[2], Fuminori Tsuchiya[3], Go Murakami[4], Hajime Kita[3], Chihiro Tao[5], Ken T. Murata[6]

1. Academic Center for Computing and Media Studies, Kyoto University, 2. RIKEN, Nishina Center for Accelerator-Based Science, 3. Planetary Plasma and Atmospheric Research Center, Graduate School of Science, Tohoku University, 4. Institute of Space and Astronautical Science, JAXA, 5. Applied Electromagnetic Research Institute, NICT, 6. Integrated Science Data System Research Laboratory, NICT

The scales in planetary magnetospheres range from 10s of planetary radii to kilometers. For a number of years, we have performed the 3-dimensional magnetohydrodynamic (MHD) simulations of Jovian magnetosphere. However, we do not open the simulation data due to the access limitation of supercomputer storage system. Recently thanks to the developments of the storage system, we can store the simulation data in the network storage system where can be accessed through the Internet. Considering this situation, we have started to develop the database of our Jovian magnetospheric simulation especially for collaboration of Jupiter's observations.

In this database, we store the multi solar wind parameters survey simulation data to see the effect of solar wind to the magnetosphere. In addition, simulations using Juno observation data for about one month are stored to compare with Hisaki and Juno observations. Thanks to the recent progress in supercomputer systems, we have obtained the capability to simulate Jupiter's magnetosphere with 1000 times the number of grid points used in our simulations. This has allowed us to combine the high-resolution global simulation with a micro-scale simulation of the Jovian magnetosphere. For the first time, we have been able to resolve Kelvin Helmholtz waves on the magnetopause in these high-resolution simulations. The size of these high-resolution data is huge (3TB/sampling) so that it is hard to download. To overcome this difficulty, we will introduce the new transfer protocol to the storage system. In this study, we show the database of Jovian simulation results and its status.

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