Study of Spacecraft Plasma Environment via 3D EM Particle simulation on the Earth Simulator

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Geospace Simulator project has been started since 2003 as one of a Epoch-making simulation project at the Earth Simulator Center (JAMSTEC). We have achieved transplant of the 3-dimensional electromagnetic particle simulation code as a Numerical Space Chamber.

3D EM particle code has been highly tuned in order to achieve maximum performance of the Earth Simulator. After tuning of the code 1000x1000x1000 grid simulation box with has been realized. This numerical space chamber can include a spacecraft whose spatial size of about 1km^3.

We will report the optimization of the 3D EM particle code on the Earth simulator and the test results including the fundamental plasma physics processes. We will also discuss our plan of inmplementaion of the unstructured-grid 3D EM particle code within the numerical space chamber.

Compound Simulation around a spacecraft