

3次元粒子計算による準垂直衝撃波大規模計算：衝撃波遷移層における3次元性

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A full-kinetic simulation study on three-dimensionality in the shock transition region of a quasi-perpendicular shock

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The high spec computational power of the JAXA's new supercomputer system, Fujitsu FX-1, enables us to perform really macro-scale three-dimensional situations with full particle plasma simulation (particle-in-cell method). Using this system, a challenging 3D run of a quasi-perpendicular shock has been done. The simulation parameters were selected to simulate a Cluster-II observational result reported by Seki et al. (2009). The full mass ratio $M/m=1840$ was taken for this simulation, and almost one ion inertia length square could be allocated for the simulation. In this simulation, simultaneously with the self-shock-reformation process, quite complicated wave activity is found at the shock foot region. Comparing the 3D results with previous 1D and 2D simulation results and the observational results, the 3D nature of the shock transition region of quasi-perpendicular shock will be discussed.