

PEM030-07

会場: 303

時間: 5月26日09:00-09:17

粒子シミュレーション研究の最近の動向

Recent advancement in particle-in-cell simulations in geosciences

梅田 隆行^{1*}, 松清 修一², 山崎 了³, 松本 洋介¹, 中村 琢磨⁴, 加藤 雄人⁵

Takayuki Umeda^{1*}, Shuichi Matsukiyo², Ryo Yamazaki³, Yosuke Matsumoto¹,
Takuma Nakamura⁴, Yuto Katoh⁵

¹名大STE研, ²九大総理工, ³青学大理工, ⁴宇宙研, ⁵東北大理

¹STEL, Nagoya Univ., ²Kyushu Univ., ³Aoyama Gakuin Univ., ⁴ISAS, JAXA, ⁵Tohoku Univ.

This paper gives a review on the recent advancement in particle-in-cell simulations in the geoscience community. The recent development of supercomputers allows us to perform large-scale and massively parallel computer simulations. In the geosciences community, collisionless shocks, magnetic reconnection, and MHD-scale turbulence (such as Kelvin-Helmholtz instability) are of interest as cross-scale coupling processes between particle kinetics and fluid dynamics. The cross-scale coupling is a fundamental process, which large-scale fully kinetic simulations are essential to understand. We will give advanced numerical techniques and latest simulation results on the cross-scale coupling.

キーワード: プラズマ, 計算機実験, 粒子シミュレーション, シミュレーション技法, スケール間結合

Keywords: plasma, computer simulation, particle-in-cell simulation, simulation technique, cross-scale coupling