ブラソフコードによる様々な超並列スーパーコンピュータの性能評価

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Performance evaluation of various massively-parallel supercomputer systems with Vlasov code

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Space plasma is a collisionless, multi-scale, and highly nonlinear medium. There are various types of self-consistent Computer simulations with the first-principle (kinetic) model are essential for studying multi-scale processes in space plasma. We develop numerical schemes for Vlasov simulations for practical use on currently-existing supercomputer systems. The eak-scaling bench-mark test shows that our parallel Vlasov code achieves a high performance and a high scalability. Currently, we use more than 1000 cores for parallel computations and apply the present parallel Vlasov code to various cross-scale processes in space plasma, such as a first-principle global simulation of solar-wind-magnetosphere interactions.