

**Interlocked simulation model in space plasma : application to collisionless shocks**

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A new simulation model is developed to understand the cross-scale coupling in space plasmas. Hall-MHD and Hybrid simulations are simultaneously performed. We call this new simulation model as Interlocked simulation model. The model can treat MHD-scale dynamics including particle kinetic effects. Here we have applied this interlocked simulation model to investigate collisionless shocks. Hall MHD simulation is performed in the whole system. And in the shock transition region, Hybrid simulation is performed to treat the wave-particle interaction.