

一様抵抗プラズモイド不安定性のMHD数値研究

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Numerical MHD study for Plasmoid Instability in Uniform Resistivity

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The plasmoid instability (PI) caused in uniform resistivity is numerically studied with a MHD HLLD numerical code. It is shown that the PI observed in numerical studies may often include numerical tearing instability caused by the numerical dissipations. The reconnection rate observed in the numerical tearing instability can be higher than that of the physical tearing instability. In addition, the tearing instability can be classified into symmetric and asymmetric tearing instability. The symmetric tearing instability tends to occur when the thinning of current sheet is stopped by the physical or numerical dissipations, often resulting in the drastic changes of the magnetic field topology in the plasmoid chain. Hence, to correctly explore PI, the numerical and symmetric tearing instability must be rigorously eliminated. In this paper, we could not specify the critical Lundquist number Sc beyond which PI is fully developed. It suggests that Sc does not exist.