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Reconnection rate in collisionless magnetic reconnection[1] ZHIWEI MA, JUN HUANG, Zhejiang University — Collisionless magnetic reconnection is studied by using two dimensional Darwin particle-in-cell simulations with different types of open boundary conditions. Simulation results indicate that reconnection rates are strongly dependent on the imposed boundary conditions of magnetic field in the inward side. With the zero-gradient boundary condition, the reconnection rate quickly decreases after reaching its maximum and no steady-state is found. For both electromagnetic and magnetosonic boundary conditions, the system can reach a quasi- steady state. But the reconnection rate $E_{||} \approx 0.08$ in the electromagnetic boundary is weaker than $E_{||} \approx 0.13$ in the magnetosonic boundary. The dependence of the reconnection rate on the length and thickness of the initial current sheet is also studied under the magnetosonic open boundary. It is found that the reconnection rate decreases with the increase of the length or thickness.

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