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An effective resistivity model of collisionless driven reconnection in an ion-scale current sheet RITOKU HORIUCHI, HIROAKI OHTANI, SHUNSUKE USAMI, National Intitute for Fusion Science, MITSUE DEN, NICT, AKIRA KAGEYAMA, Kobe U. — Many particle simulation studies [1,2] have revealed that frozen-in condition is broken due to particle kinetic effects and collisionless reconnection is triggered when current sheet is compressed as thin as ion kinetic scales under the influence of external driving flow. A reconnection system evolves into a quasi-steady state after an initial transient phase if the driving flow satisfies some condition [1]. In the steady state, reconnection electric field generated by microscopic physics evolves inside ion meandering scale so as to balance the flux inflow rate at the inflow boundary, which is controlled by macroscopic physics. That is, effective resistivity generated through this process can be expressed by balance equation between micro and macro physics. This effective resistivity model is applied to magnetic reconnection phenomena in the Earth magnetosphere. In case of southward solar wind magnetic field with an oblique component, intermittent plasmoid ejection was observed in the night-site region of the magnetosphere as a result of magnetic reconnection around 10-20 of the earth radius.

[1] W. Pei, R. Horiuchi, and T. Sato, Physics of Plasmas,Vol. **8** (2001), pp. 3251-3257.
[2] A. Ishizawa, and R. Horiuchi, Phys Rev Lett, Vol. **95**, 045003 (2005).

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