

*Hinode-3: 3rd Hinode Science Meeting
Hitotsubashi Memorial Hall, Tokyo
1-4 December, 2009*

Magnetic reconnection in weakly ionized solar chromosphere

Hiroaki Isobe

Unit of Synergetic Studies for Space, Kyoto University

Alkendra Singh

Kwasan and Hida Observatories, Kyoto University

Kazunari Shibata

Kwasan and Hida Observatories, Kyoto University

Vinod Krishan

Indian Institute of Astrophysics Bangalore

Abstract. Observations by the Solar Optical Telescope on board Hinode have found many pieces of evidence that magnetic reconnection is occurring ubiquitously in the solar chromosphere. However, whether and how fast magnetic reconnection is realized in the fully collisional and weakly ionized chromospheric plasma is poorly understood. In this paper we present the results of magnetohydrodynamic simulations with ambipolar diffusion, which we show to be relevant for studying chromospheric dynamics. We found that two sub-structures develop in the reconnecting current sheet: inner sharp current sheet where ohmic diffusion dominates and outer current sheet where ambipolar diffusion dominates. Then magnetic islands are formed by resistive tearing instability in the inner current sheet. Subsequent coalescence of the islands and ejection of the large islands lead to a plasmoid-induced type fast reconnection.