Abstract Submitted
for the DPP10 Meeting of
The American Physical Society

Experimental Simulation of Magnetic Reconnection in the Sunspot Light Bridge YOSHINORI HAYASHI, HIROSHI TANABE, MICHIAKI INOMOTO, YASUSHI ONO, University of Tokyo, TOSHIFUMI SHIMIZU, SHINSUKE IMADA, NAOTO NISHIZUKA, Japan Aerospace Exploration Agency
— Intermittent and recurrent chromospheric plasma ejections were discovered in the sunspot light bridge (LB) by the Solar Optical Telescope of the Hinode satellite (Shimizu et al. 2009, ApJ, 696, L66). Strong current was observed under the jet, suggesting existence of twisted flux tube in the vertical background field. The magnetic reconnection between the flux tube and the vertical field is considered to cause the plasma ejection. It is left unsolved why the intermittent reconnection continuing more than one day. Note that the magnetic configuration of LB is similar to the spheromak plasma maintained by vertical field in the laboratory. We formed spheromak in the TS-4 device and drove magnetic reconnection with center solenoid coil. We measured 2D magnetic profile of the reconnecting field lines between the spheromak and the solenoid coil by the magnetic probe array and local temperature, density and plasma flow at the reconnection point by the Langmuir probes and ion Doppler spectroscopy. We will discuss about the LB reconnection by comparing the laboratory experiment with the satellite observation.

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Date submitted: 22 Jul 2010 Electronic form version 1.4