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Improved Magnetic Reconnection Experiment at FRC Device MING XU, RUIJIE ZHOU, DANIEL VASQUEZ, TIAN-SEN HUANG, Prairie View A&M University, PRAIRIE VIEW SOLAR OBSERVATORY TEAM — With experimental facility's improvement, magnetic reconnection has been further studied at Prairie View rotamak device. By adding one toroidal current in the central part of the rotamak device, the cutting of one magnetic field reverse configuration (FRC) as two FRCs in the experiment process becomes more obvious. Differing from the magnetic reconnection experiments conducted at other labs, where magnetic reconnection is formed with two ware-coiled currents buried in a chamber with large scale magnetic field, in our magnetic reconnection experiment the main source of the magnetic field is plasma current. Thus, the magnetic reconnection experiments conducted at rotamak device are closer to the one occurring in the space and on the sun. At the present stage, our experiments focus on the study of the change in electron temperature during the magnetic reconnection process. Furthermore, the ion temperature and plasma flow can be easily achieved from fast ion Doppler spectroscopy (IDS) diagnostic system [1], which makes the magnetic reconnection process more clearly.

- [1] Petrov, Y., X. Yang, et al., Physics of Plasmas, 15(7): 072509-072508 (2008)
- [2] Houshmandyar, S., X. Yang, et al., Review of Scientific Instruments $83(10)\colon 10\mathrm{D}506\ (2012)$

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