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Fast Ion Doppler Spectroscopy Measurements During Magnetic Reconnection in a Compact Torus SAEID HOUSHMANDYAR, XIAOKANG YANG, TIAN-SEN HUANG, Prairie View A&M University — The preliminary results of ion temperature (T_i) and flow velocity measurements at the Prairie View (PV) Rotamak, which can operate in Field-Reversed Configuration (FRC) and Spherical Tokamak (ST) regimes, are presented. The measurements are performed through a fast ($1 \mu\text{s}$ time resolution) Ion Doppler Spectroscopy (IDS) diagnostics, which employs a Jarrell-Ash 50 monochromator with a ruled diffraction grating of 1180 G/mm line density, over 40 ms plasma discharge period. In order to identify the impurity emission lines, a BWTek *i*-trometer spectrometer is used to record a time-integrated spectrum of each plasma shot. Furthermore, the measurements are extended to the magnetic reconnection experiments, where two FRCs are formed when magnetic shaping coils [Yang *et al*, Phys. Rev. Lett **102**, 255004 (2009)] are energized, and later the two FRCs are merged when the DC current flowing through the shaping coils is shut off. Here, the variations in T_i and flow velocity during the magnetic reconnection are investigated.

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