

Abstract Submitted  
for the DPP09 Meeting of  
The American Physical Society

**Effect of Magnetic Field Configuration on  $n = 1$  Instabilities in Rotamak** XIAOKANG YANG, YURI PETROV, TIAN-SEN HUANG, Prairie View A&M University — The  $n = 1$  tilt/radial shift modes are observed in rotating magnetic field (RMF) driven FRC plasmas. Experiments studying on the response of  $n = 1$  instabilities to the changes of magnetic field structure have been conducted in 40 ms Rotamak discharges. In one series of experiments the axial current  $I_z$  (which produces toroidal field) ramps linearly in time from 0 to 2 kA, leading to transition from FRC to ST configuration. The amplitude of the tilt mode is suddenly doubled when  $I_z$  reaches 0.5 kA (compare to 2 kA plasma current); the amplitude remains at this level when  $I_z$  is in the range of 0.5-1 kA. The tilt instability disappears when  $I_z$  exceeds 1 kA. In other series of experiments, by using a middle shaping coil with a moderate current of 0.25-0.5 kA, the doublet-FRCs are formed which are completely free from both the tilt and radial shift modes.

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Date submitted: 16 Jul 2009

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