

Abstract Submitted
for the DPP10 Meeting of
The American Physical Society

Study of Plasma Shape Control and Current Drive XIAOKANG YANG, JERMAIN GOSS, EZRA SIDNEY, ASHFAQUR RAZZAQ, TIAN-SEN HUANG, Prairie View A&M University — An equilibrium control system has been installed at the Prairie View (PV) rotamak. This system consists of three coils wound over the chamber surface and connected to a programmable current source. The coils are used to control both plasma shape and boundary poloidal magnetic flux. The effect of equilibrium control system on plasma current has been examined in two series of experiments: the field-reversed configuration (FRC), and spherical tokamak (ST) configuration with a steady toroidal magnetic field. For a given 200 kW RF power, plasma current is boosted from 2.1 kA to 5.2 kA when the shaping coils are energized with a total DC current around 550 A. The boost of plasma current is mainly due to the increase of plasma elongation and thus the enhancement of coupling between RF antenna and plasma. Plasma discharge is disrupted when the current in the shaping coils is above 600 A. In FRC regime, the disruption is related to the excitation of $n = 1$ radial shift mode; while in ST regime, no instability mode is observed, the disruption is due to the poor coupling.

Xiaokang Yang
Prairie View A&M University

Date submitted: 06 Jul 2010

Electronic form version 1.4