Abstract Submitted
for the DPP10 Meeting of
The American Physical Society

Helical Magnetic Self-Organization in the RFX-mod and MST devices P. FRANZ, P. PIOVESAN, M. SPOLAORE, S. CAPPELLO, M.E. PUIATTI, Consorzio RFX, EURATOM-ENEA Association, Padova, Italy, B.E. CHAPMAN, J.S. SARFF, D.J. DEN HARTOG, J.A. GOETZ, M.B. MCGARRY, E. PARKE, J.A. REUSCH, H.D. STEPHENS, Y.M. YANG, University of Wisconsin-Madison
— Self-organization of the reversed field pinch with large helical structure (QSH regimes) is predominant as plasma current is increased. In RFX-mod, the persistence and strength of the QSH state increases markedly above 1 MA. An internal transport barrier appears, and plasma thermalization within the helical magnetic surfaces reflects improved confinement. The QSH regime is also obtained in MST plasmas, which operates with plasma current up to nearly 0.6 MA. We report here a statistical analysis of the tearing mode behavior in MST (e.g., amplitudes and QSH persistency) that reveals a trend with plasma current similar to that observed in RFX-Mod. This trend supports an expectation for universal behavior that depends on parameters such as the Lundquist number that vary with the plasma current. Analysis of the common database from the two devices should help reveal key physics for QSH onset and dynamics. Planned Thomson scattering measurements and transport analysis on MST will be important to compare with the confinement behavior established for RFX-Mod. Work supported by USDoE.

Paolo Franz
Consorzio RFX

Date submitted: 21 Jul 2010 Electronic form version 1.4