Abstract Submitted
for the DPP06 Meeting of
The American Physical Society

Spectral Motional Stark Effect Measurements in MST D. CRAIG, Wheaton College, K. CASPARY, D.J. DEN HARTOG, G. FIKSEL, S. GANGADHARA, University of Wisconsin - Madison and CMSO — Direct localized measurements of the magnetic field down to ~ 0.2 Tesla in MST are made using a recently upgraded Motional Stark Effect diagnostic. Measurements of the magnetic field magnitude at the plasma axis and of the vector magnetic field at the mid radius provide strong constraints on the internal magnetic field profile and the current density profile. The full Stark spectrum for each location is recorded and fit with a model for the beam emission. Detailed modeling of the collisional excitation of the beam is performed to understand features of the spectrum not explained by simply assuming a statistical weights population for the atomic levels. Fast shutters allow exposures as short as 100 μs and an EMCCD detector with 2.4 ms framing enables low noise single shot analysis of the evolution of the magnetic field throughout the 20 ms diagnostic neutral beam pulse. The magnetic field on axis drops during relaxation events in standard plasmas but is unaffected by smaller events in enhanced confinement plasmas. During inductive current drive experiments (Pulsed Poloidal Current Drive and Oscillating Field Current Drive), the magnetic field on axis closely follows the evolution of the toroidal plasma current. Work Supported by U.S.D.O.E. and N.S.F.

Darren Craig
Wheaton College

Date submitted: 20 Jul 2006 Electronic form version 1.4