Abstract Submitted
for the DPP13 Meeting of
The American Physical Society

Electron Bernstein Wave Studies in MST[1] ANDREW SELTZMAN, JAY ANDERSON, CARY FOREST, PAUL NONN, MARK THOMAS, JOSHUA REUSCH, ERIC HENDRIES, University of Wisconsin-Madison — The overdense condition in a RFP prevents electromagnetic waves from propagating past the extreme edge. However use of the electron Bernstein wave (EBW) has the potential to heat and drive current in the plasma. MHD simulations have demonstrated that resistive tearing mode stability is very sensitive to the gradient in the edge current density profile, allowing EBW current drive to influence and potentially stabilize tearing mode activity. Coupling between the X-mode and Bernstein waves is strongly dependent on the edge density gradient. The effects on coupling of plasma density, magnetic field strength, antenna radial position and launch polarization have been examined. Coupling as high as 90% has been observed. Construction of a 450kw RF source is complete and initial experimental results will be reported. The power and energy of this auxiliary system should be sufficient for several scientific purposes, including verifying mode conversion, EBW propagation and absorption in high beta plasmas. Target plasmas in the 300-400kA range will be heated near the reversal surface, potentially allowing mode control, while target plasmas in the 250kA range will allow heating near the core, allowing better observation of heating effects. Heating and heat pulse propagation experiments are planned, as well as probing the stability of parametric decay during mode conversion, at moderate injected power.

[1]Work supported by USDOE.

Andrew Seltzman
University of Wisconsin-Madison

Date submitted: 11 Jul 2013 Electronic form version 1.4