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Electron Bernstein Wave Studies in MST ANDREW SELTZMAN, JAY ANDERSON, CARY FOREST, PAUL NONN, JASON KAUFFOLD, ALLAN O'CONNER, University of Wisconsin, STEPHANIE DIEM, ORNL — The overdense plasma in an RFP prevents electromagnetic waves from propagating past the 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 gradients in the edge current density profile, allowing EBW current drive to be potentially stabilizing. The development of the new equipment includes a 5.5GHz klystron driven by a novel switchmode power supply. In preparation for the commissioning of a 1MW heating system which will evaluate the potential use of EBW for current profile control, several experiments of EBW coupling to the MST plasma have been performed. Due to the steep edge density gradient in the RFP, it is possible to efficiently couple to the EBW. The EBW is strongly damped at the electron cyclotron resonance where it couples to the electron gyromotion and alters the electron distribution. Either Fisch-Boozer or Ohkawa current drive mechanisms can be activated to drive off axis current in the plasma. Preliminary experiments will be performed to verify high power coupling and understand heating via observed x-ray emission when compared to Fokker-Plank modeling in CQL3D. Work supported by USDOE.

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