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Electron Bernstein Wave Studies in MST[1] ANDREW SELTZMAN, JAY ANDERSON, CARY FOREST, PAUL NONN, MARK THOMAS, University of Wisconsin-Madison — The overdense condition 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. A 450kw RF source that generates 2ms pulses at 5.55GHz and an antenna system with suitable power handling capability has been constructed. The design and implementation of a suitable launch structure is challenging in the RFP for several reasons. It is necessarily a low-field-side launch due to the magnetic field geometry, the close-fitting conducting shell requires a minimum port hole size, the port hole leads to local magnetic field perturbation that affects the resonance condition, and there is a very small vacuum gap between the shell and plasma leading to substantial antenna-plasma interaction. Testing of an EBW waveguide antenna system for use in heating experiments is underway. A multi-chord soft x-ray camera and spectrum analyzer connected to a receiving probe antenna are used to look for evidence of electron heating and coupling effects. Power handling tests on the antenna are used to determine the maximum capabilities of the system without arcing. Heating with the EBW is attempted and methods to improve coupling in the RFP are examined.

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