Diagnosis of lower hybrid experiments on MST*

D.R. Burke, J.A. Goetz, M.C. Kaufman, A. Almagri, J.K. Anderson
Department of Physics, University of Wisconsin, Madison, WI 53706

RF driven current has never been demonstrated in a Reversed Field Pinch. Recently the lower hybrid system on the Madison Symmetric Torus reached a new operating regime. This upgrade allows rf powers of up to 5% of the Ohmic input power. It is therefore anticipated that the lower hybrid system is on the threshold of producing meaningful changes to the RFP equilibrium. A diagnostic set is under development to facilitate the study of such changes and lay the foundation for a near Megawatt operations. Many measurements are being studied for viability. These include electron cyclotron emission, examinations of bulk ion and electron heating, surface perturbation pickup coils, magnetic probe measurements, and Langmuir probe measurements. Many x-ray diagnostics will also be used. In addition, several x-ray diagnostics are in operation: pulse height analysis is performed on detector arrays to determine the 5-200 keV spectrum. An insertable target probe is available to create x-rays from fast electrons. Tomographic inversion of 2-D Soft x-ray detectors is yields equilibrium information through island structure. Results from experiments with source power up to 225 kW will be presented. Preliminary results from CQL3D Fokker-Planck simulations will also be presented.

*Work supported by US DOE Contract DE-FC02-05ER54814