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**Microwave Heating Experimental at Prairie View Rotamak** RUI-JIE ZHOU, MING XU, DANIEL VASQUEZ, TIAN-SEN HUANG, Prairie View A&M University, PRAIRIE VIEW SOLAR OBSERVATORY TEAM — A 6kW 2.45GHz microwave generator has been added, and a study of microwave heating experiment is performed at Prairie View Rotamak. This is the first time to apply microwave heating to a rotating magnetic field drive field reversed configuration. Rotamak is a compact torus that the toroidal plasma current is driven by means of an externally applied rotating magnetic field (RMF) with a large plasma current being generated to reverse the external equilibrium magnetic field on the symmetry axis, so a field-reversed configuration (FRC) is formed. The plasma current is produced by external rotating magnetic field, the plasma equilibrium shape is controlled by the magnetic shaping coils. The added microwave with power adjustable is injected from the top of the plasma chamber. In the experiment:  $f_{pe} \approx 10^4$  GHz and  $f_{ce} \approx 30$  MHz ( $f_{ce} \ll f \ll f_{pe}$ , where  $f_{pe}$ ,  $f_{ce}$  are respectively electron plasma and cyclotron frequencies and  $f$  is the frequency of microwave). Consequently, the interaction between microwave and plasma is more complicated, and a series of experiments are performed at Prairie View Rotamak and some results are achieved for the following experiment. At first, a comparison experiment is performed for FRC and ST cases, and the coupling effect between high frequency microwave and plasma is being studied. Secondly, the microwave can offer a new method to affect some of MHD instabilities (such as tilt mode).  $n=1$  tilt instability has been suppressed by magnetic shaping coils previously.

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