

Abstract Submitted
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Density Measurements of Compact Toroidal Hybrid Plasmas and Design of an Interferometer-Polarimeter Diagnostic¹ B.A. STEVENSON, G. HARTWELL, S. KNOWLTON, J. SHIELDS, Physics Department, Auburn University — A single-channel 4-mm heterodyne microwave interferometer (on loan from ORNL) provides line-integral density measurements of ECRH and current-driven plasmas in the CTH torsatron ($R = 0.75$ m, $a \sim 0.2$ m, $B \leq 0.7$ T, $n_e \leq 10^{19}$ m⁻³). Densities up to the cutoff value $n_e = 0.4 \times 10^{19}$ m⁻³ are obtained in ECRH only plasmas. Higher densities are observed when ohmic heating is applied to the ECRH plasmas, however the measurement is often compromised due to refraction. The interferometer is presently set up in a double pass Mach-Zehnder configuration using a retro-reflector mounted on the inner wall of the CTH vessel. In addition, a 1mm interferometer-polarimeter system similar to 3-color FIR polarimeters [1] is currently being designed to provide electron density and current density profiles of current-driven CTH discharges in conjunction with V3FIT modeling. Details of the design will be presented.

[1] J. Rommers and J. Howard, Plasma Phys. Control. Fusion 38 (1996) 1805

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