

Abstract Submitted
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Transmission line component testing for the ITER Ion Cyclotron Heating and Current Drive System¹ RICHARD GOULDING, G.L. BELL, C.E. DEIBELE, M.P. MCCARTHY, D.A. RASMUSSEN, D.W. SWAIN, G.C. BARBER, C.N. BARBIER, I.H. CAMBELL, R.L. MOON, P.V. PESAVENTO, Oak Ridge National Laboratory, E. FREDD, N. GREENOUGH, C. KUNG, Princeton Plasma Physics Laboratory — High power RF testing is underway to evaluate transmission line components for the ITER Ion Cyclotron Heating and Current Drive System. The transmission line has a characteristic impedance $Z_0 = 50\Omega$ and a nominal outer diameter of 305 mm. It is specified to carry up to 6 MW at VSWR=1.5 for 3600 s pulses, with transient voltages up to 40 kV. The transmission line is actively cooled, with turbulent gas flow (N_2) used to transfer heat from the inner to outer conductor, which is water cooled. High voltage and high current testing of components has been performed using resonant lines generating steady state voltages of 35 kV and transient voltages up to 60 kV. A resonant ring, which has operated with circulating power of 6 MW for 1 hr pulses, is being used to test high power, low VSWR operation. Components tested to date include gas barriers, straight sections of various lengths, and 90 degree elbows. Designs tested include gas barriers fabricated from quartz and aluminum nitride, and transmission lines with quartz and alumina inner conductor supports. The latest results will be presented.

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