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Theory Experiment

Measurement and Analysis of ECH Power Injected Into DIII-D,* P.S. Johnson, *Butler U.*, J. Lohr, *General Atomics* – The 6 ECH waveguides at DIII-D are on the order of 100 meters in length with up to 16 miter bends. Accurate measurement of the ratio of generated-to-transmitted power gives the transmission line efficiency directly and is essential for analysis of experiments. The power generated by the gyrotrons is measured calorimetrically for each pulse, but direct measurements of the injected power have relied on analysis of modulated plasma heating, which can overlook significant power where plasma volumes are large and ECH driven temperature fluctuations are small. High power tests of efficiencies of individual components have been difficult due to mutual interaction of components, sensitivity of power monitors to polarization, and the generally high efficiency of the components. We report a direct measurement of the efficiencies of complete transmission lines, using a high power dummy load placed at the end of each DIII-D waveguide. Experimental results will be compared to previous measurements and to theoretical calculations of the performance of the components and waveguide lines.

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