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First High Power Results from the General Atomics Comblines on the JFT-2M Tokamak¹ R.I. PINSKER, C.C. PETTY, D.A. PHELPS, C.P. MOELLER, R.W. CALLIS, *General Atomics*, T. OGAWA, Y. MIURA, *Japan Atomic Energy Research Institute* — A new approach to the design of fast wave antenna arrays based on the traveling wave antenna has been successfully tested at high power on the JFT-2M tokamak. A traveling wave antenna array is powered through a single feed and the power flow from element to element is by mutual reactive coupling only. A twelve-element array for operation at 200 MHz was designed, fabricated, and installed on the JFT-2M tokamak. The full output power of a single transmitter, 0.2 MW, was coupled to tokamak discharges with very little conditioning required. The input impedance of the structure was well matched to the transmission line impedance (power reflection coefficient < 4%) for all conditions *without adjustment of any tuning elements*. The excellent match was completely insensitive to L/H-mode transitions and ELMs; in fact, the antenna was as equally well matched to vacuum (no plasma load) as to the very heavy resistive loading in Taylor discharge cleaning plasmas. These results demonstrate the remarkable robustness of the comblines antenna design and its applicability to high power tokamak heating and current drive experiments.

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R.I. Pinsker
Bob.Pinsker@gat.com
General Atomics

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