

**Abstract Submitted for the 52nd Annual Meeting  
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Category Number and Subject:

Theory      Experiment

**High-Power Fast Wave Coupling Experiments in Advanced Regimes in DIII-D,\*** R.I. Pinsky, T.C. Luce, P.A. Politzer, *General Atomics*; M. Porkolab, *MIT*; F.W. Baity, R.H. Goulding, G.R. Hanson, M. Murakami, P.M. Ryan, *ORNL*; J.C. Hosea, A. Nagy, J.R. Wilson *PPPL*; R. Maggiora, D. Milanesio, *U. Torino* – Up to 1.5 MW of fast wave (FW) power has been successfully coupled to the core of ELMing H-mode discharges with  $\beta_N \sim 2.5$  in conjunction with  $\sim 7$  MW of neutral beam injection and 1.5 MW of electron cyclotron (EC) heating. FW core heating efficiency is observed to be comparable to that of an equal amount of incremental EC power, as expected with first-pass FW absorption on core electrons of 76%. Antenna loading is in quantitative agreement with modeling when edge density profiles measured with a reflectometer adjacent to the antenna are used in the model. Local deuterium puffing is used in some cases to increase the loading and hence the coupled power. Comparison of gas puffing and other techniques to increase the antenna loading are evaluated with respect to core plasma performance. Extension of the coupled FW power levels towards 3.5 MW is projected.

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