

Abstract Submitted
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Using modulated on-axis ICRH to control fluctuations in an internal transport barrier¹ D.R. ERNST, C.L. FIORE, A. DOMINGUEZ, S. WOLFE, J.W. HUGHES, Y. MA, N. TSUJII, M. GREENWALD, A. HUBBARD, Y. PODPALY, M.L. REINKE, J.E. RICE, J.L. TERRY, S. WUKITCH, MIT, S. ZWEBEN, PPPL — These recent experiments demonstrate apparent success in modulating core transport and fluctuations in an internal transport barrier (ITB) with ICRF heating, serving to localize phase contrast imaging measurements of density fluctuations. With well-resolved profile measurements for both ions and electrons, including flows, this provides a validation testbed for gyrokinetic simulations of electron transport. Modulated electron temperature swings of 40% were accompanied by strong bursts of density fluctuations on phase contrast imaging (PCI), while edge fluctuations from reflectometry and Mirnov coils diminished. Previously, we observed strong density fluctuations during steady on-axis heating of C-Mod ITB's. Nonlinear gyrokinetic simulations of TEM turbulence [1] in the ITB reproduced the shape of the measured fluctuation wavelength spectrum during on-axis heating, using a synthetic PCI diagnostic in GS2, while matching the particle flux [2].

[1] D. R. Ernst et al., 20th IAEA Fusion Energy Conference (2006), Chengdu, China, paper IAEA-CN-149/TH/1-3, http://www-pub.iaea.org/MTCD/Meetings/FEC2006/th_1-3.pdf

[2] D. R. Ernst et al., Phys. Plasmas 11 (2004) 2637.

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