

Abstract Submitted
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Effect of ECH on Turbulent Fluctuations During ITER Baseline Discharges on DIII D¹ A. MARINONI, J.C. ROST, M. PORKOLAB, E.M. DAVIS, MIT, R.I. PINSKER, K.H. BURRELL, GA, DIII-D TEAM — Recent experiments on the DIII-D tokamak simulating the ITER Baseline Scenario show that torque-free and spatially localized Electron Cyclotron Heating (ECH), compared to neutral beam heating, modifies flow shear and density fluctuations, resulting in a slightly worse confinement degradation than that given by the IPB98(y,2) scaling[1]. After turning off ECH, the Phase Contrast Imaging diagnostic measures, on confinement time scales, a decrease in the intensity of fluctuations at frequencies lower than 200 kHz, consistent with the mean flow shear exceeding the maximum linear growth rate of ITG modes. In contrast, at higher frequencies the intensity of fluctuations increases promptly, due to ETG modes enhanced by the prompt increase of the electron temperature inverse scale length in the outer third of the minor radius. The latter effect is seen in preliminary non-linear gyro-kinetic simulations to generate a larger transient heat flux and an inward particle pinch.

[1] R.I. Pinsker, EPJ Web of conferences 87 (2015) 02003.

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