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The Effects of Dilution on Turbulence and Transport in C-Mod Ohmic Plasmas and Comparisons With Gyrokinetic Simulations[1] PAUL ENNEVER, MIKLOS PORKOLAB, JOHN RICE, J. CHRIS ROST, EVAN DAVIS, DARIN ERNST, CATHERINE FIORE, AMANDA HUBBARD, JERRY HUGHES, JIM TERRY, MIT, NAOTO TSUJII, University of Tokyo, JEFF CANDY, GARY STAEBLER, General Atomics, MATTHEW REINKE, University of York, AND ALCATOR C-MOD TEAM — Main ion dilution had been predicted by gyrokinetic simulations to decrease the turbulent ion thermal transport in C-Mod ohmic plasmas in the radial range of r/a = 0.4-0.8 [1]. This predicted effect was tested with a set of experiments on C-Mod where ohmic plasmas across the LOC (linear ohmic) -SOC (saturated ohmic) transition densitywere seeded with Nitrogento dilute them. The seeding decreased the ion energy diffusivity and increased the electron density at which the toroidal rotation reversed direction. Experiments were also performed by injecting Arto increase Zeff without significantdilution to separate the two effects. GYRO, TGYRO, and TGLF simulations were performed on nitrogen seeded discharges and it was found that the simulations using experimental profiles agreed with the electron heat flux, but over-predict the ion flux. To get agreement between simulated and experimental ion flux, the experimental ion temperature profiles had to be flattened slightly but within experimental error.

[1] M. Porkolab, et. al., Plasma Phys. and Contr. Fusion, 54, 124029 (2002).

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