

Abstract Submitted
for the DPP06 Meeting of
The American Physical Society

Density peaking at low collisionality on Alcator C-Mod¹ M. GREENWALD, D. ERNST, A. HUBBARD, J.W. HUGHES, Y. LIN, J. TERRY, S. WUKITCH, K. ZHUROVICH, MIT - Plasma Science & Fusion Center — While H-modes tend to have very flat density profiles, modest density peaking is advantageous for fusion performance. Thus robust pinch mechanisms that could allow operation with peaked profiles, in the absence of any internal particle source, are of considerable interest. Recent experiments on C-Mod, at low collisionality, show just such peaking and are consistent with earlier results from ASDEX-U² and JET³. The experiments reported here extend the range of collisionality in C-Mod H-modes downward by almost an order of magnitude. The ratio of central to pedestal density $n_e(\psi = 0)/n_e(\psi = 0.95)$ exceeds 2.0 and $n_e(\psi = 0.4)/n_e(\psi = 0.8)$, which is a measure of peaking in the confinement zone, exceeds 1.5. Wall fueling is exceptionally shallow, in these plasmas, due to their high absolute density ($> 1.5 \times 10^{20}/m^3$) and no beams are used for heating, therefore there is no ambiguity due to competing sources of core particles. Initial gyrokinetic simulations for these discharges will be shown.

¹Supported by USDoE award DE-FC02-99ER54512.

²C. Angioni, et al., PRL 90, 205003, 2003.

³H. Weisen, Nucl. Fusion 45, L1, 2005.

Martin Greenwald
MIT-Plasma Science & Fusion Center

Date submitted: 21 Jul 2006

Electronic form version 1.4