

Abstract Submitted
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New Developments in Trapped Electron Mode Turbulence¹ D.R. ERNST, K. ZELLER, N. BASSE, L. LIN, M. PORKOLAB², W. DORLAND, Univ. Maryland, A. LONG, Cornell University — The onset of TEM turbulence is believed to limit density gradients in Alcator C-Mod internal transport barriers.¹ We have recently modified GS2 to make direct comparisons with phase contrast imaging measurements of density fluctuations in the ITB.² Further, the TEM critical density gradient is nonlinearly upshifted,¹ analogous to the Dimits shift for ITG turbulence.³ In the ITG case, ion-ion collisions reduced the upshift by damping zonal flows.⁴ In contrast, this new TEM nonlinear upshift persists in the presence of realistic ion-ion and electron-ion collisions, and increases with collisionality.⁵ Quasi-periodic bursts arise near threshold, with a period dependent on the relative primary growth and zonal flow damping rates. Nonlinear simulations of this regime confirm the role of zonal flows. ¹D. R. Ernst et al., Phys. Plasmas 11 (2004) 2637. ²D. R. Ernst *et al.*, 2004 IAEA Fusion Energy Conference, paper IAEA-CN116/TH/4-1, http://www-naweb.iaea.org/napc/physics/fec/fec2004/datasets/TH_4-1.html, and A. Long *et al.*, this conference. ³A. M. Dimits *et al.*, Phys. Plasmas 7(3)(2000) 969. ⁴Z. Lin *et al.*, Phys. Rev. Lett. 7(5) (2000) 1857. ⁵D.R. Ernst, K. Zeller, and W. Dorland, 2005 Sherwood Int'l Fusion Theory Conference, P3-33.

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