Abstract Submitted
for the DPP11 Meeting of
The American Physical Society

Theoretical investigation of the quasi-coherent mode[1] J.R. MYRA, D.A. BAVER, D.A. D'IPPOLITO, D.A. RUSSELL, Lodestar Research Corp., M.V. UMANSKY, LLNL, J.W. HUGHES, B. LABOMBARD, MIT — It is of interest to identify candidates and physical mechanisms for the quasi-coherent (QC) mode, which is thought to be an essential ingredient for obtaining EDA operation on Alcator C-Mod. We employ the 2DX edge eigenvalue code for this purpose because it allows convenient comparison of a wide variety of physics models, and incorporates realistic divertor geometry and global profiles in the edge and SOL region. Neither drift-resistive modes (driven by plasma gradients and curvature), nor perpendicular and parallel Kelvin Helmholtz (KH) modes (driven by radial shear in velocity) provide linear candidates with growth rates that show a strong peak in the experimentally observed range of wave-numbers. Similar remarks also apply to a nonlinear SOLT simulation model [D. A. Russell et al, this meeting] which, nevertheless, produces a QC-like oscillation. A qualitative model presented here suggests that nonlinear mode-coupling together with certain spectral features are critical ingredients for the QC mode.

[1]Supported by USDoE awards DE-FG02-97ER54392 and DE FC02-99ER54512.

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Date submitted: 13 Jul 2011 Electronic form version 1.4