Abstract Submitted
for the DPP05 Meeting of
The American Physical Society

Spontaneous generation of solitary structures in tokamaks
R.M.G.M. TRINES, ROBERT BINGHAM, CCLRC Rutherford Appleton Laboratory, UK, L.O. SILVA, J.T. MENDONCA, Instituto Superior Tecnico, Lisbon, Portugal, P.K. SHUKLA, Ruhr-Universitaet Bochum, Bochum, Germany, W.B. MORI, University of California, Los Angeles, USA — The interaction between broadband drift mode turbulence and zonal flows has been studied through the wave-kinetic approach [1]. Simulations have been conducted in which a particle-in-cell representation is used for the quasi-particles, while a fluid model is employed for the plasma. Simulation results show the spontaneous emergence of solitary structures about an ion gyroradius wide, drifting down the background density gradient. The interactions have been studied in a plasma edge configuration which has important implications for transport phenomena in tokamak plasmas.

[1] R. Trines et al., Phys. Rev. Lett. 94, 165002 (2005).

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Date submitted: 25 Jul 2005 Electronic form version 1.4