Abstract Submitted
for the DPP06 Meeting of
The American Physical Society

Scaling characteristics of convective blob transport in the SOLT model of edge and scrape-off layer turbulence[1] D.A. RUSSELL, D.A. D'IPPOLITO, J.R. MYRA, Lodestar Research Corporation — Following the observation that enhanced blob transport is correlated with electrical disconnection from the sheath in 3D BOUT simulations, [1] the SOLT (Scrape-Off Layer Turbulence) *2-region model* code was developed to study the interaction between curvature-driven turbulent transport in the outboard midplane and resistive current loops in the X-point region. In this *reduced* model, evolution equations of vorticity and density are solved in the plane perpendicular to the local B-field in the two regions, and are coupled in the parallel direction by a *jump condition* on Ohm's law that involves the parallel resistivity. Enhanced cross-field conductivity, by X-point induced field-line fanning and shear, [2] is achieved via the coordinate transformation between the two regions. Vorticity loss to the sheath is included in the X-point region. Results of simulations that explore the *regime-dependent*, predicted radial velocity scaling with blob size [3] are presented, including progress on extracting scaling laws for self-consistent blob creation and propagation in different turbulent regimes [3] of collisionality and scale size. 1. D.A. Russell, D.A. D'Ippolito, J.R. Myra, W.M. Nevins, X.Q. Xu, Phys. Rev. Lett. **93**, 265001 (2004). 2. D. Farina, R. Pozzoli, and D.D. Ryutov, Nucl. Fusion **33**, 1315 (1993). 3. J.R. Myra and D.A. D'Ippolito, Phys Plasmas **12**, 092511 (2005).

[1]Work supported by U.S. DOE grant DE-FG02-97ER54392.

David A. Russell
Lodestar Research Corporation

Date submitted: 18 Jul 2006 Electronic form version 1.4