2-D analysis of edge turbulence velocity and blobs in Alcator C-Mod

S.J. Zweben[1], J.L. Terry[2], M. Agostini[3],
B. Davis[1], O. Grulke[4], B. LaBombard[2],
D.A. D'Ippolito[5], J.R. Myra[5], D.A. Russell[5]

[1]PPPL, Princeton NJ
[2]MIT, Cambridge MA
[3] Consorzio RFX, Padova Italy
[4] IPP, Greifswald, Germany
[5] Lodestar Research, Inc.

The time-dependent radial and poloidal velocities of edge turbulence have been evaluated using a 2-D time-delayed cross-correlation analysis of movies taken using the gas puff imaging (GPI) diagnostic at 400,000 frames/sec. We report on a search for low frequency zonal flows over the frequency range ~1-40 kHz and radial range about $-0.5 < \rho < 2$ cm near the outer midplane separatrix. We also calculate correlations between radial and poloidal velocity, which may be related to poloidal momentum transport, and between radial velocity and turbulence intensity, which may be related to radial particle transport. A separate analysis has tracked the 2-D motion of individual blobs in the SOL, and this blob velocity distribution will be compared with 2-D velocities from the cross-correlation analysis. These results will also be compared with analytical models of blob transport and with recent SOLT simulations of C-Mod edge turbulence.