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Observations and Interpretation of the Spatial Structure of Edge Turbulence near the X-point Region and Outboard Midplane of Alcator C-Mod[1] J.L. TERRY, MIT-PSFC, S.J. ZWEBEN, PPPL, B. LABOMBARD, I. CZIEGLER, MIT-PSFC, M.V. UMANSKY, LLNL, D.P. STOTLER, PPPL — Movies of edge turbulence at both the outboard midplane and the region just outboard of the typical LSN X-point location in C-Mod have been obtained using Gas-Puff-Imaging together with fast-framing cameras. Intermittent turbulent structures, typically referred to as blobs or filaments, are observed in both locations. Near the midplane the filaments are roughly circular in cross-section with radial and poloidal correlation lengths of ~ 1 cm, while in the X-point region they are highly elongated in cross-section in a direction approximately normal to the local flux surfaces. In addition, filament velocities in this region are $\sim$ 3x faster than the radial velocities at the midplane and in a direction that is roughly radially outward. The observations are consistent with the picture that the large scale features of the filaments ($k_\perp \rho_s > 0.1$) map along field lines as a consequence of the rapid parallel diffusion of the potential perturbations. A 3D simulation using the BOUT turbulence code reproduces many of the spatial features observed in the experiment.

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