

Abstract Submitted  
for the DPP11 Meeting of  
The American Physical Society

**Parallel correlation of turbulent fluctuations in the SOL of Alcator C-Mod**<sup>1</sup> O. GRULKE, MPI for Plasma Physics, J.L. TERRY, B. LABOMBARD, I. CZIEGLER, MIT-PSFC, S.J. ZWEBEN, PPPL — Turbulent fluctuations in the scrape-off layer (SOL) of fusion devices generally show an intermittent character with large-amplitude fluctuations in plasma density and potential. Gas-puff imaging (GPI) allows observation of the spatiotemporal dynamics of SOL fluctuations and reveals that those events are associated with the formation of spatiotemporal fluctuation structures. The structures propagate radially outwards due to their self-consistent dipolar potential, thereby contributing significantly to the cross-field transport. They are predominantly located on the outboard side and are essentially absent in the inboard SOL. The present study investigates their parallel dynamics by correlating outboard midplane fluctuations with those in the region of high magnetic shear close to the lower X-point. After producing a magnetic geometry that magnetically connects a reciprocating probe to the 2D view of the GPI at the midplane (with a connection length  $\sim 3\text{m}$ ), maximum correlation amplitudes of  $\sim 95\%$  are observed between the emission fluctuations and the density and potential fluctuations measured at the probe. The time delay of maximum correlation is on average smaller than  $1\mu\text{s}$ , which is much shorter than expected for parallel density diffusion.

<sup>1</sup>Supported by USDoE award DE-FC02-99ER54512.

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Date submitted: 13 Jul 2011

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