

Abstract Submitted
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Surface fluctuations in the Liquid Metal Experiment¹ J. RHOADS, E. SPENCE, E. EDLUND, PPPL, J. KUBRICHT, University of Texas, Austin, P. SLOBODA, H. JI, PPPL — MHD fluids such as liquid metals become tied to magnetic field lines, which may have significant implications for thermal convection in proposed liquid-metal divertor concepts. Experiments have been conducted in the Liquid Metal Experiment (LMX) using a GaInSn eutectic alloy as a working fluid to investigate the anisotropization due to the magnetic field on turbulent structures in the flow. These experiments considered free-surface, wide aspect-ratio flow through a channel situated in a strong vertical magnetic field (up to $Ha \approx 50$). By tracking the deflection of the free surface in three locations of varying separation distance, correlation analysis in both the down-stream and cross-stream directions gave insight into how the fluctuations were affected by the application of the magnetic field. The cross-correlation of these signals as a function of separation distance showed the correlation-length, while the coherence of these signals indicated how the fluctuations were suppressed across the frequency spectrum. Experimental results and proposed explanations will be presented.

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