Abstract Submitted
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Relationship between Edge Gradients and Plasma Flows in Alcator C-Mod[1] B. LABOMBARD, N. SMICK, A. GRAF, K. MARR, R. MCDERMOTT, M. REINKE, M. GREENWALD, J.W. HUGHES, B. LIPSCHULTZ, J.L. TERRY, D.G. WHYTE, MIT PSFC — The edge pressure profiles in a tokamak are remarkably 'stiff', suggestive of a system near marginal stability. Electromagnetic turbulence appears to be an underlying cause [1]: edge pressure gradients normalized by the square of the poloidal magnetic field strength (i.e., the MHD ballooning parameter, α_{MHD}) are invariant in plasmas with the same normalized collisionality. Yet, despite this relationship, x-point topology exerts a surprisingly strong influence; higher α_{MHD} are obtained when $Bx\nabla B$ points toward the active x-point [2] – Is this behavior connected to the strong flows and/or toroidal rotation that is observed in the edge, which changes with x-point topology [3]? Recently, an expanded set of diagnostics has been used to explore edge flows in detail for upper/lower x-points with forward/reversed magnetic fields. Systematic differences in parallel flows and toroidal rotation are evident. Cross-field flows measured by scanning Mach probes reveal an enhanced (diminished) velocity shear layer near the separatrix for $Bx\nabla B$ pointing toward (away from) the active x-point. [1] Nucl. Fusion **45** (2005) 1658; [2] Phys. Plasmas **15** (2008) 056106; [3] Nucl. Fusion **44** (2004) 1047.

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