

Abstract Submitted
for the DPP06 Meeting of
The American Physical Society

Real-time sensing and gas jet mitigation of VDEs on Alcator C-Mod¹ R.S. GRANETZ, S.M. WOLFE, V.A. IZZO, M.L. REINKE, J.L. TERRY, J.W. HUGHES, K. ZHUROVICH, MIT Plasma Science and Fusion Center, D.G. WHYTE, M. BAKHTIARI, U. of Wisconsin, Dept of Engineering Physics, G. WURDEN, Los Alamos National Lab — Experiments have been carried out in Alcator C-Mod to test the effectiveness of gas jet disruption mitigation of VDEs with real-time detection and triggering by the C-Mod digital plasma control system (DPCS). The DPCS continuously computes the error in the plasma vertical position from the magnetics diagnostics. When this error exceeds an adjustable preset value, the DPCS triggers the gas jet valve (with a negligible latency time). The high-pressure gas (argon) only takes a few milliseconds to enter the vacuum chamber and begin affecting the plasma, but this is comparable to the VDE timescale on C-Mod. Nevertheless, gas jet injection reduced the halo current, increased the radiated power fraction, and reduced the heating of the divertor compared to unmitigated disruptions, but not quite as well as in earlier mitigation experiments with vertically stable plasmas. Presumably a faster overall response time would be beneficial, and several ways to achieve this will also be discussed.

¹Work supported by DOE awards DE-FC02-99ER54512, DE-FG02-04ER54758, W-7405-ENG-36

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Date submitted: 23 Jul 2006

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