

Abstract Submitted
for the DPP96 Meeting of
The American Physical Society

Sorting Category: 5.1.1.2 (Experimental)

Disruption Mitigation using Impurity Pellet Injection in DIII-D,¹ P.L. TAYLOR, A.G. KELLMAN, T.E. EVANS, D.A. HUMPHREYS, A.W. HYATT, R.L. LEE, M.J. SCHAFFER, General Atomics, J.W. CUTHBERTSON, S. LUCKHARDT, J. ZHANG, University of California, San Diego, T. JERNIGAN, Oak Ridge National Laboratory, D.G. WHYTE, INRS-Energie et Materiaux — In a series of dedicated disruption experiments conducted on DIII-D, measurements of the halo current magnitude and toroidal peaking factor, measurements of thermal loads to the first wall, and disruption induced forces on the vessel have been made during both major disruptions and vertical displacement events (VDE's). Experiments using impurity pellet injection have successfully mitigated these disruption effects; reducing the halo current magnitude and toroidal peaking factor, the vertical force on the vessel, and enhancing the power loss through the radiation channel. There is evidence of runaway electron generation following the pellet injection. Pre-emptive discharge termination has also been studied by injecting an impurity pellet. Detailed measurements comparing disruptions with and without “killer” pellets have been made and include data on the temperature and density profiles, the radiation losses, and the role of MHD.

¹Work supported by U.S. DOE Contracts DE-AC03-89ER51114, DE-AC05-96OR22464 and Grant No. DE-FG03-95ER54294.

Prefer Oral Session
 Prefer Poster Session

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Special instructions: P-2-20

Date submitted: August 1, 1996

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