Abstract Submitted
for the DPP06 Meeting of
The American Physical Society

Disruption and Runaway Electron Mitigation With MGI in DIII-D[1] J.C. WESLEY, D.A. HUMPHREYS, P.B. PARKS, E.J. STRAIT, General Atomics, E.M. HOLLMANN, G. ANTAR, U. California-San Diego, T.C. JERNIGAN, S.K. COMBS, Oak Ridge National Laboratory, M. GROTH, Lawrence Livermore National Laboratory — Past and ongoing disruption mitigation studies in DIII-D employing massive gas injection (MGI) are reviewed and compared with theoretical expectations. Emphasis in the review will be placed on 1) the gas hydrodynamic delivery considerations that determine the rate of impurity and electron delivery to the plasma edge, 2) the role of MHD instability and internal reconnection in effecting edge-to-core mixing of the edge-deposited impurities, and 3) assessment of the mechanism(s) whereby MGI mitigates divertor energy deposition, reduces halo current magnitude and asymmetry and avoids runaway electron production and/or Coulomb-avalanche multiplication. Selected considerations for application of DIII-D MGI results to ITER (wherein time scales for impurity delivery are relaxed relative to DIII-D and other present experiments) will also be addressed.

[1]Work supported by U.S. DOE under DE-FC02-04ER54698, DE-FG02-04ER54758, DE-AC05-00OR22725, and W-7405-ENG-48.

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Date submitted: 21 Jul 2006 Electronic form version 1.4