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Disruption Mitigation by High Pressure Gas Injection in DIII-D: Summary of the Results and Scaling to Future Experiments[1] T.C. JERNIGAN, S.K. COMBS, Oak Ridge National Laboratory, D.G. WHYTE, D.S. GRAY, E.M. HOLLMANN, UCSD, D.A. HUMPHREYS, M.J. SCHAFFER, GA, C.J. LASNIER, LLNL —
High pressure gas injection has been shown to be an effective disruption mitigation technique in DIII-D [1,2], offering dramatic reductions in localized power deposition and forces to the internal components due to halo currents. The high effective electron density inhibits runaway electron generation during the plasma current decay. The local ram pressure of the gas jet (∼30 kPa) exceeds the plasma pressure, while the high density of the neutral gas shields the interior of the jet from ionization by the plasma electrons. Experiments have included pre-triggered firing of the gas jet as well as initial experiments with the jet trigger controlled by the DIII-D Plasma Control System in response to radiative/density limit, vertical displacement events, and unstable tearing modes. Scaling possibilities to Next Step Devices will be discussed.

[1] P.L. Taylor, *et al.*, Phys. Plasmas **6**, 1872 (1999).
[2] D.G. Whyte, *et al.*, to be published Phys. Rev. Lett.

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