

Abstract Submitted
for the DPP97 Meeting of
The American Physical Society

Sorting Category: 5.8 (experimental)

Hardware Advances in Disruption Mitigation by Pellet Injection on DIII-D¹ T.C. JERNIGAN, L.R. BAYLOR, S.K. COMBS, S.L. MILORA, Oak Ridge National Laboratory, T.E. EVANS, P.B. PARKS, General Atomics — During the past year several improvements have been made in the ORNL pellet injector hardware on DIII-D to test new approaches to disruption mitigation. Frozen methane pellets have been produced and fired into the tokamak, with encouraging results. In addition, a pellet propellant valve has been fitted with a 300 ml high pressure reservoir to inject a massive helium gas burst (2000 mbar-liter $\Delta < n_e > \approx 7 \times 10^{21} \text{ m}^{-3}$) in 10 ms. This will be used in experiments both with and without impurity “killer” pellets to mitigate disruptions while minimizing the generation of run-away electrons as the current ramps down. Other innovations are being explored. One is the possibility of a pellet shotgun where the combination of multiple tiny pellets of differing atomic composition in addition to the propellant gas will allow atomic tailoring of the injected material to minimize run-away production.

¹Supported by U.S. DOE Contracts DE-AC05-96OR22464, DE-AC03-89ER51114.

Prefer Oral Session
 Prefer Poster Session

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Date submitted: July 7, 1997

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