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Large, Shattered Pellets for Disruption Mitigation in DIII-D[1]
T.C. JERNIGAN, L.R. BAYLOR, S.K. COMBS, N. COMMAUX, S.J. MEITNER, ORNL, E.M. HOLLMANN, Y.H. YU, UCSD, D.A. HUMPHREYS, M.A. VAN ZEELAND, J.C. WESLEY, GA — A new pellet injector, the "shotgun" pellet injector for disruption mitigation studies, has been installed on the DIII-D tokamak. The large pellets ($\sim$15 mm diam. x 22 mm long, 2.3×10^{23} electrons with D_2) are shattered on a series of plates and directed toward the plasma magnetic axis. Previous experiments using massive gas injection (MGI) showed that the gas was stopped at the plasma edge and only penetrated diffusively until an MHD event, triggered by the cooling wave, transported some of the ionized gas from the edge to the interior. While the disruption forces and heat load to the first wall were significantly reduced by MGI, the core density achieved was insufficient to achieve suppression of runaway electrons from the avalanche process. Initial experiments with the new injector have demonstrated direct penetration of some of the shattered pieces deep into the plasma. Details of assimilation, mitigation, and density achieved in subsequent experiments will be presented.

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