Abstract Submitted
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Energy Confinement Improvement with Density in Gas Puff Fueled High Performance Hybrid Plasmas on DIII-D.[1] T.H. OSBORNE, T.W. PETRIE, A.W. LEONARD, T.C. LUCE, C.C. PETTY, General Atomics, F. TURCO, Columbia U., M.E. FENSTERMACHER, C.J. LASNIER, LLNL, J.G. WATKINS, SNL — In contrast to behavior at moderate NBI heating, an increase in energy confinement is observed in high power, near double null, hybrid discharges in response to D2 gas puff fueling. This difference is tied to how the H-mode pedestal responds to fueling. At low power the pedestal width decreases with gas puff resulting in a strong reduction in the critical pressure gradient for the ballooning branch of the peeling-ballooning mode. At high power the pedestal width remains fixed and access to high pedestal pressure gradient with increased collisionality along the peeling boundary is maintained, allowing the pedestal pressure to increase with density. Access to the high pressure gradient peeling limited regime is also blocked by the ballooning boundary if the shape departs from near double null or q decreases relative to the favorable conditions: DRSEP $\approx$ 2.5mm, q95 $\approx$ 6.

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