Abstract Submitted
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Physics Issues for Extending the Pulse Length of High f_{NI} DIII-D Discharges[1] J.R. FERRON, T.C. LUCE, P.A. POLITZER, J.C. DEBOO, T.W. PETRIE, C.C. PETTY, R.J. LA HAYE, S.P. SMITH, GA, C.T. HOLCOMB, LLNL, F. TURCO, ORISE, M. MURAKAMI, J.-M. PARK, ORNL, Y. IN, FAR-TECH, M. OKABAYASHI, PPPL, E.J. DOYLE, UCLA, H. REIMERDES, Columbia U. — The increase of the total available NB and gyrotron injected energies has enabled study of high f_{NI} discharges with the high β_N phase extended to >3 s. To minimize n_e for maximum EC and NB CD, discharges were produced after a boronization. Typically $H_{98} \approx 1.5$, but the common decrease in n_e in the later portion of the high β_N phase correlates with reduced τ_E. The broadly deposited ECCD appears to improve $n = 1$ tearing mode stability, but a 2/1 or 3/1 mode is more likely with longer pulses as profiles are not stationary. Scaling of J_{NI} with B_T was studied to best match J_{NBCD}, J, and the P_{beam} required for a given β_N. Short ELM-free phases, perhaps from improved H-mode pedestal stability at high β_p, and rapid fishbone-like bursts were found to affect discharge stability and capability for β_N control.

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