

Abstract Submitted  
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**Stability of Elevated- $q_{min}$  Steady-State Scenarios on DIII-D<sup>1</sup>** C.T. HOLCOMB, B. VICTOR, LLNL, J.R. FERRON, T.C. LUCE, General Atomics, E. SCHUSTER, U. Lehigh — Limits to high performance steady-state operation with  $q_{min} > 1.4$  and  $\beta_N \leq 3.5$  are identified and explained. Various  $\beta_N$  and q-profile histories were produced while testing feedback control of these profiles. Ten pulses had no core MHD at  $\beta_N = 3.4-3.5$ , with  $q_{min} = 1.4-1.8$ , and  $q_{95} = 5-5.8$ . These have predicted ideal-wall kink  $\beta_N$  limits between 4 and 5. One pulse had an n=1 tearing mode (TM) at  $\beta_N = 3.5$  with no clear trigger. Five pulses developed n=1 TMs when  $\beta_N = 2$ ,  $q_{min} = 2$ , and  $q_{95} = 4.7$ . Stability calculations for these latter cases will be shown. In seven other shots, additional NBI power from sources with more normal injection was used, and these had off-axis fishbone (OAFB) modes at  $\beta_N = 3.5$ . These sources produce more large-radius trapped ions whose precession can drive OAFB. Preliminary analysis suggests a threshold power or voltage exists. In some cases OAFB appear to trigger n=1 TMs. These studies seek to clarify the operational limits of a steady-state scenario for next step devices.

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