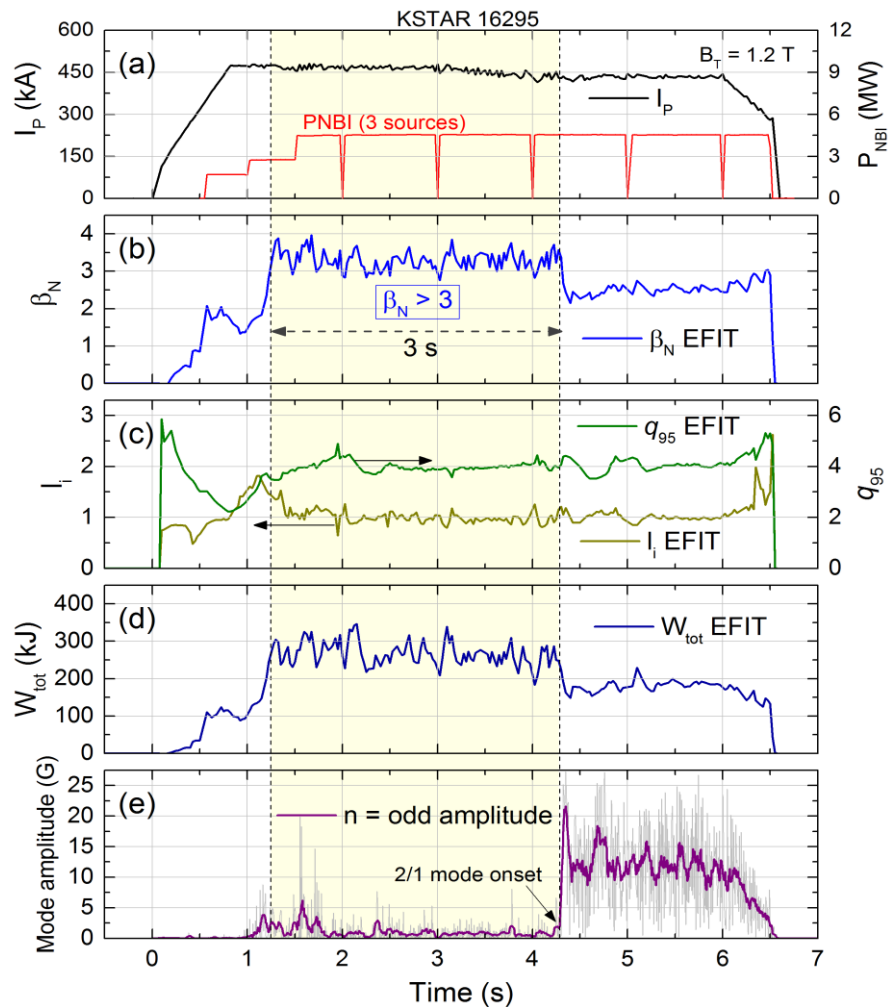


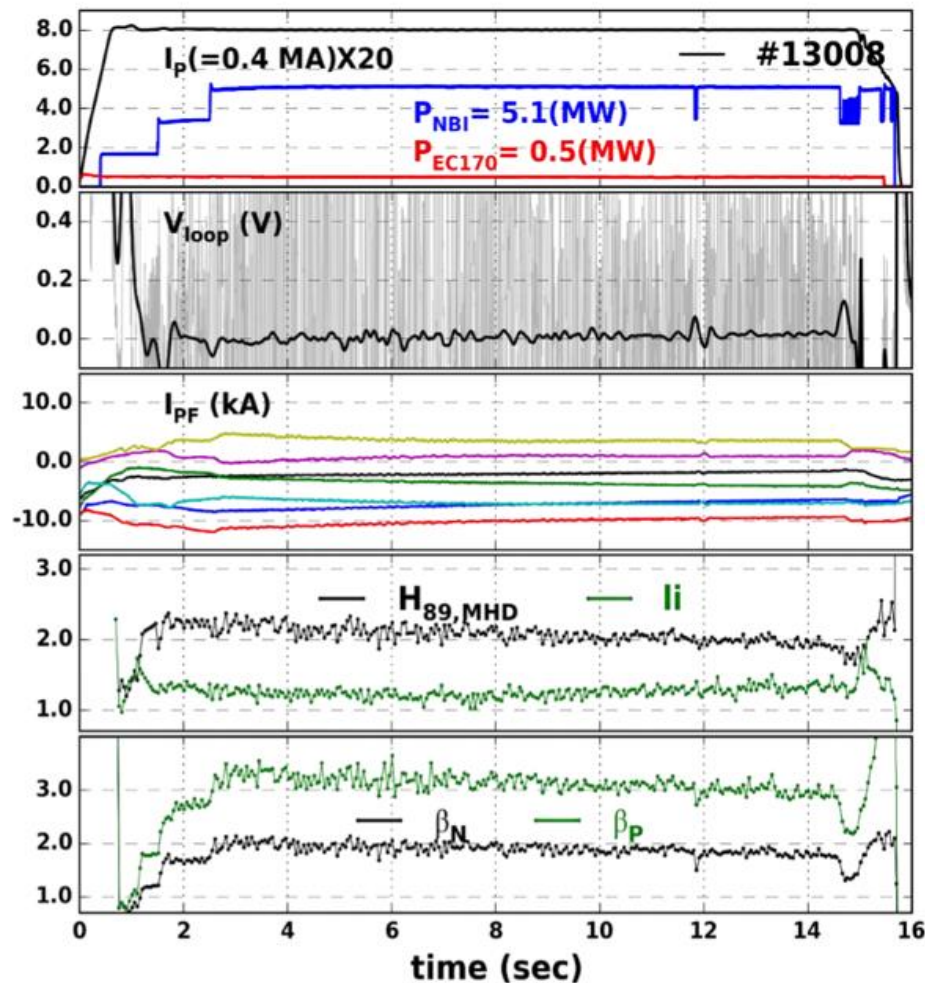
# Extension of operational boundary of high-beta long-pulse operation at KSTAR

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Successful development of both high  $\beta_N$  and  $\beta_p$  discharges for long-pulse compatible scenarios at KSTAR



KSTAR high  $\beta_N$  discharge evolutions for 3 seconds ( $\beta_N > 3$ ,  $I_p = 0.6$  MA,  $B_T = 1.2$  T,  $q_{95} \sim 4$ ,  $li \sim 1$ )



Steady-state high  $\beta_p$  discharge sustained for 12 seconds ( $\beta_p > 3$ ,  $I_p = 0.4$  MA,  $B_T = 2.9$  T,  $q_{95} \sim 11$ ,  $H_{89} \sim 2.1$ ,  $li \sim 1.2$ )