

Long pulse high current plasmas at high κ

D. A. Gates

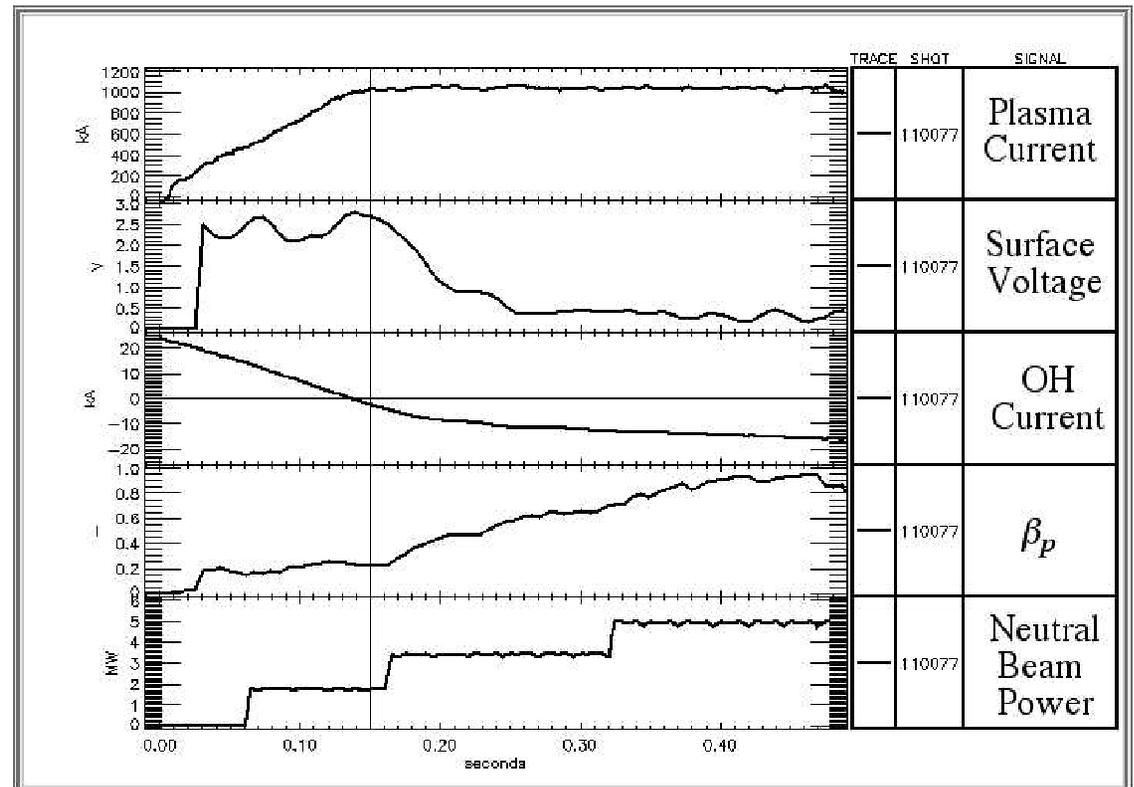
Presented at the 2003 NSTX Research Forum

10/10 - 10/12/03

Princeton, NJ

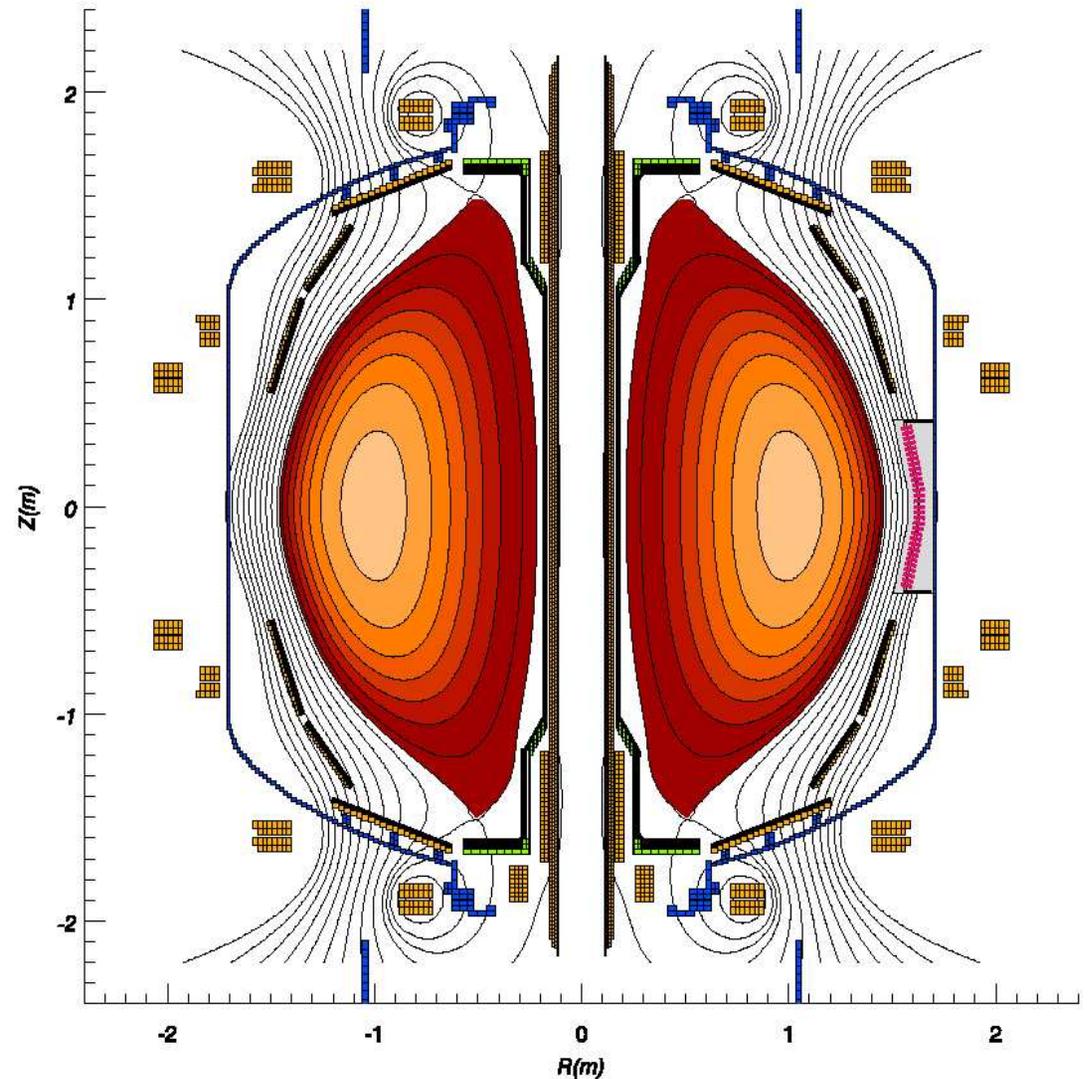
Pulse length extended with early shaping

- Successful prescription for long pulse 1MA discharges
 - Rapid κ ramp
 - High δ early
 - Early beams
 - Rapid current ramp (10/MA/s)
- More should be better!



Higher k shape identified

- Interim solution until PF1A modification allows high dx
- Has high effective d
- Shape will be controlled by rtEFIT (J. Ferron)



Experiment important to achieving goals from 5 year plan

- All long pulse discharges to date have been at elevated TF
 - Inconsistent with ST goals (high β_t) and NSTX machine limitations (I^2t limit on TF require $B_t \sim 0.3\text{T}$ for 5s discharge)
- New capabilities at higher κ permit access to high β_t and β_p simultaneously
- Should enable long pulse discharges at 3kG