

Summary of XP-727

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NSTX Results review

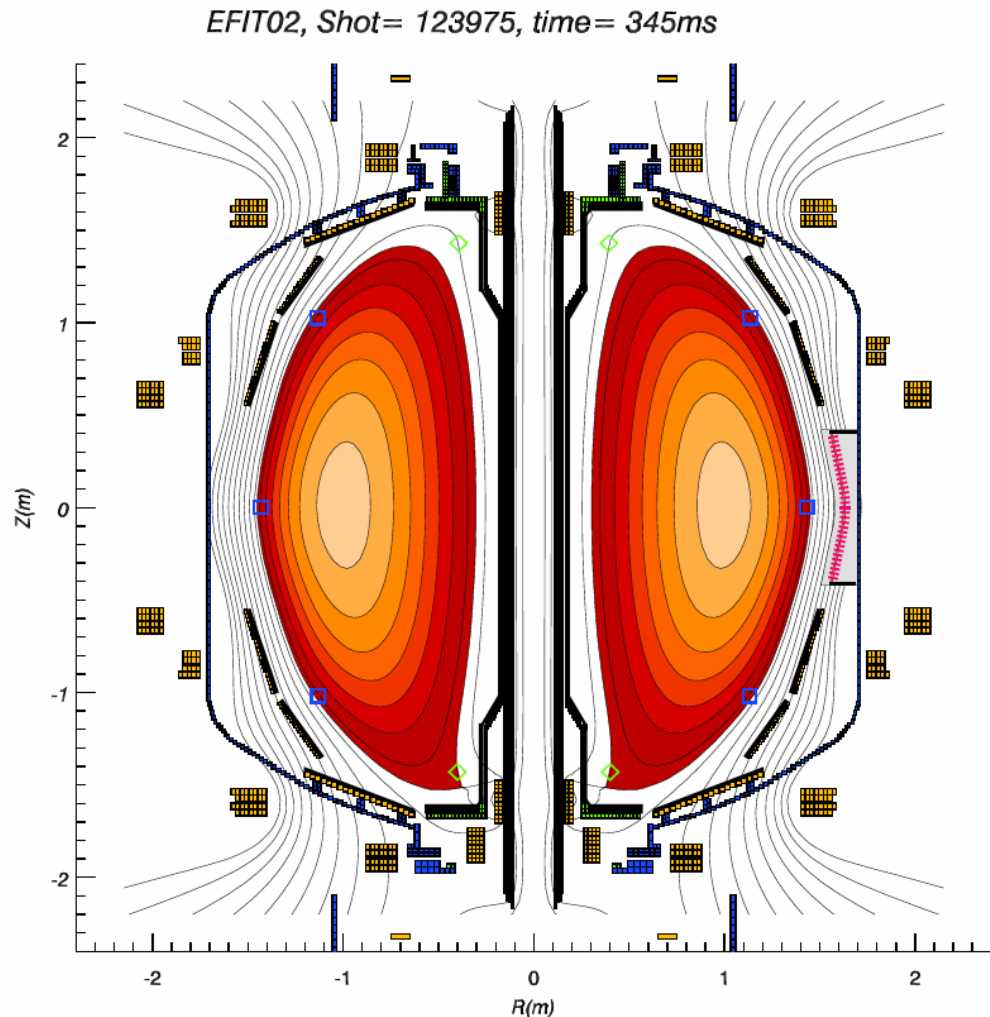
7/24/2007

XP Goals

- Attempt to achieve high toroidal beta using the plasma shape developed for XP727
 - Vary I_p and B_t
- Use LITER to improve confinement

Plasma Shape was achieved

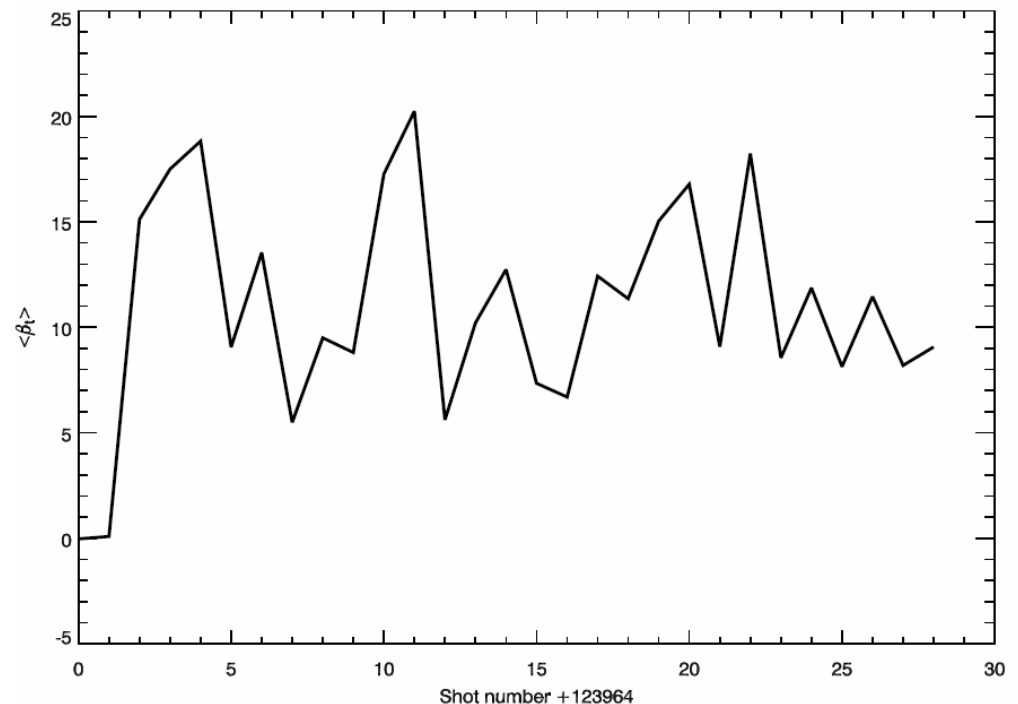
- $A = 1.5$, $\kappa = 2.6$
- $I_i = 0.5$, $\beta_{Nmax} \sim 4.5$
- Plasma shape was constant shot-to-shot
- Lithium evaporated at $\sim 20\text{mg/minute}$ for the entire day



High β was not achieved

- Plasma current was scanned from 1 - 1.2MA, B_t scanned from 0.3 - 0.4Tesla
- As in many low field experiments maximum β was not particularly reproducible

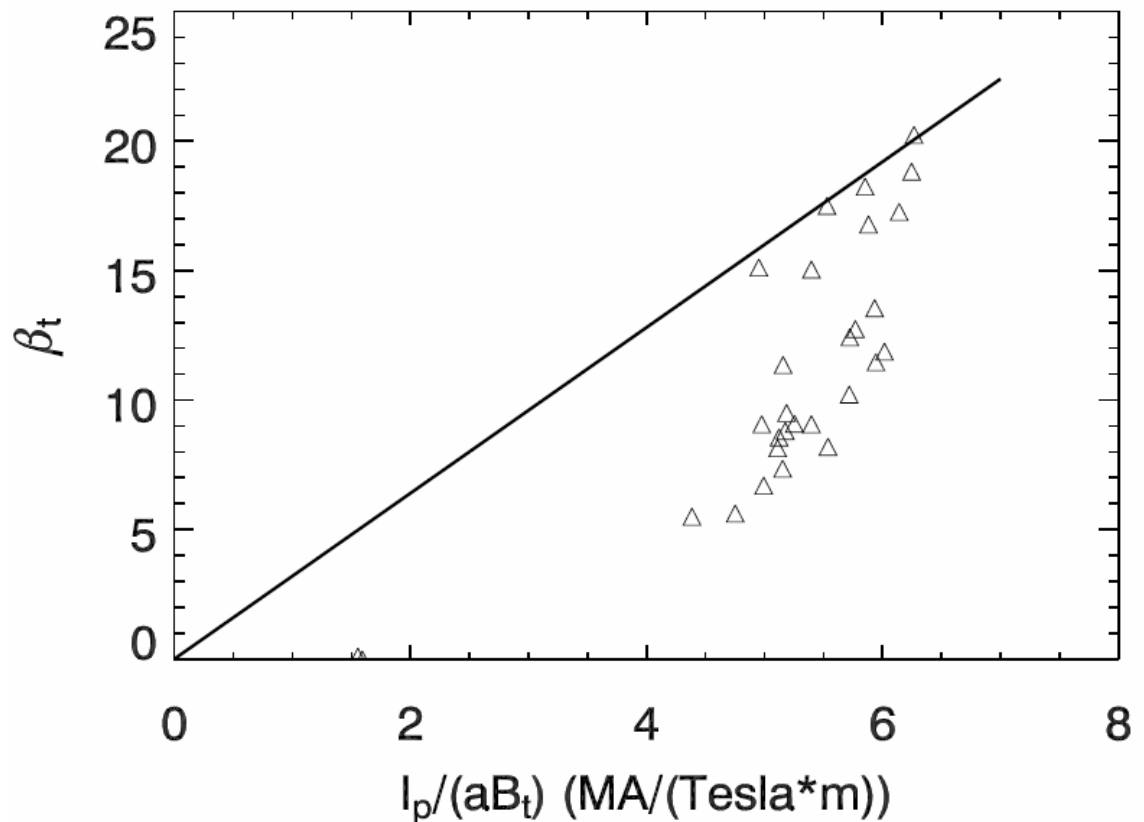
Pulse average toroidal beta achieved during XP727 versus shot number



Low β -limit consistent with other high- κ higher A lithium experiments

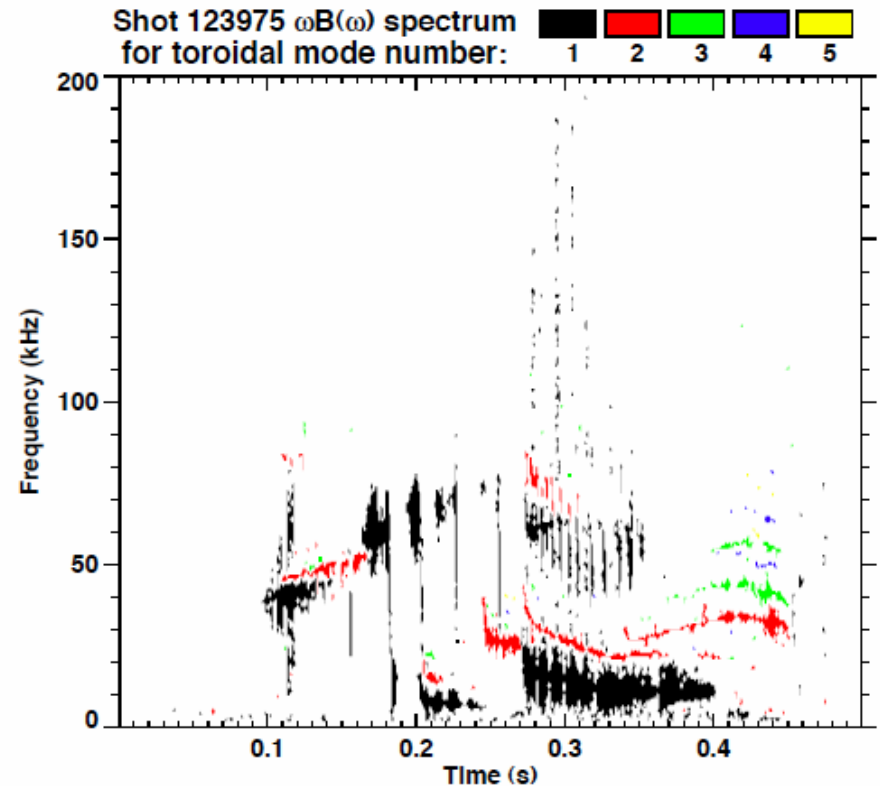
- Average β_N scales with I_p/aB , indicating a beta limit
- Plasma appear to end with internal mode β -collapse

Troyon plot for shots from XP-727



MHD spectra

- MHD evolution not dissimilar to fiducial discharge
- No sign of low frequency mode preceding b-collapse
- Need to check USXR data to identify rapid internal modes



Summary

- Plasma shape achieved and maintained over limited current field scan
- Lower β -limit consistent with other plasmas at higher aspect ratio with lithium
- Important to understand reduced β in this condition, important for NHTX and the future of LITER.