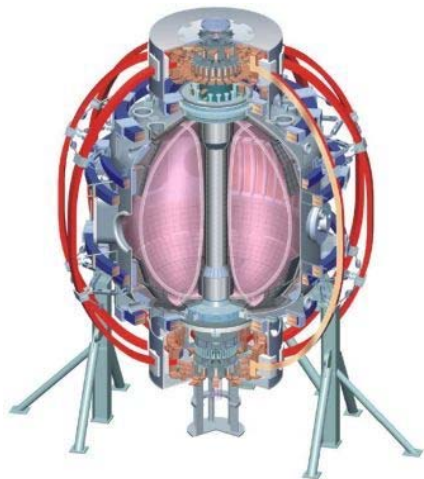


XP proposal :

High-n Stability Test using Resonant Field Amplification

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B318, PPPL
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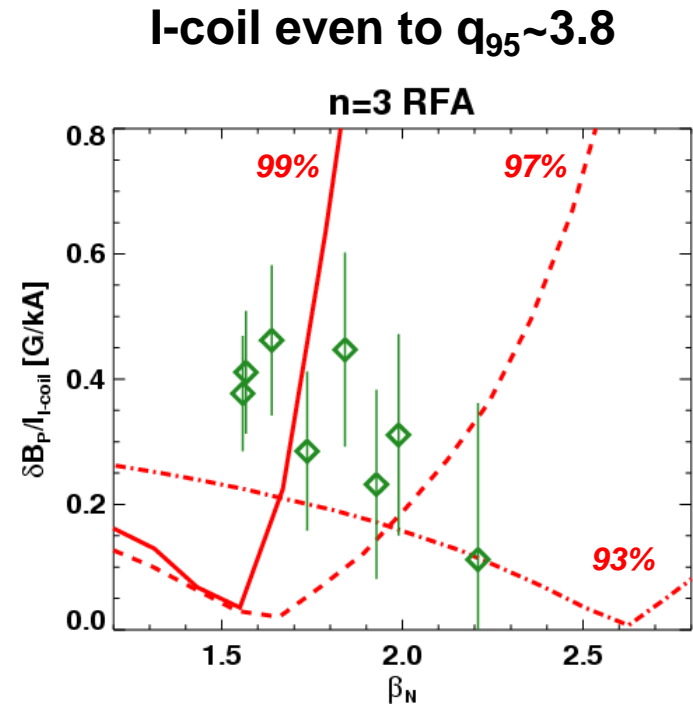
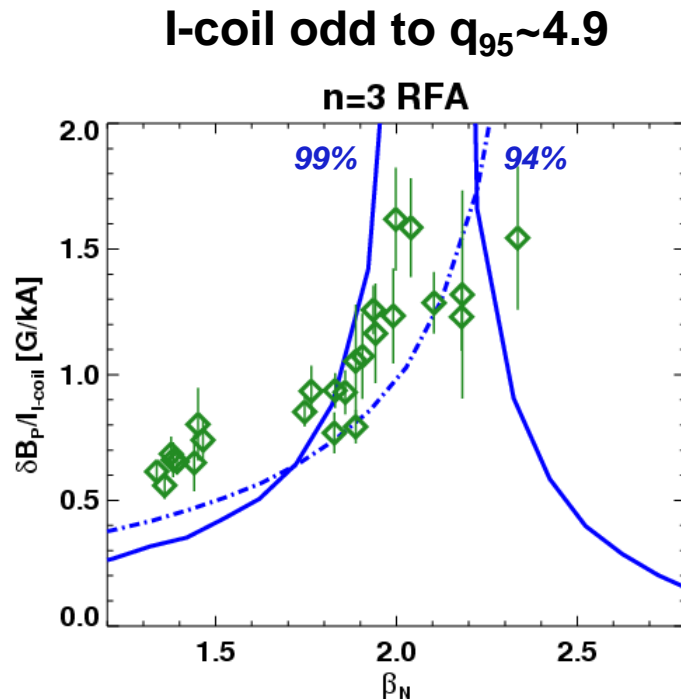
Motivation

- High- n ($n > 1$) stability in NSTX is hard to test since
 - Higher stability limit is expected
 - Kink vs. peeling is not obvious in high- n stability
- Resonant Field Amplification (RFA) can provide information for stability
 - RFA increases towards the stability boundary
- RFA by $n=2$ (rotating) and $n=3$ (oscillating) field will be useful if can be measured
 - Feasibility for this XP can be quickly tested

DIII-D measured n=3 RFA using oscillating field and benchmarked theory

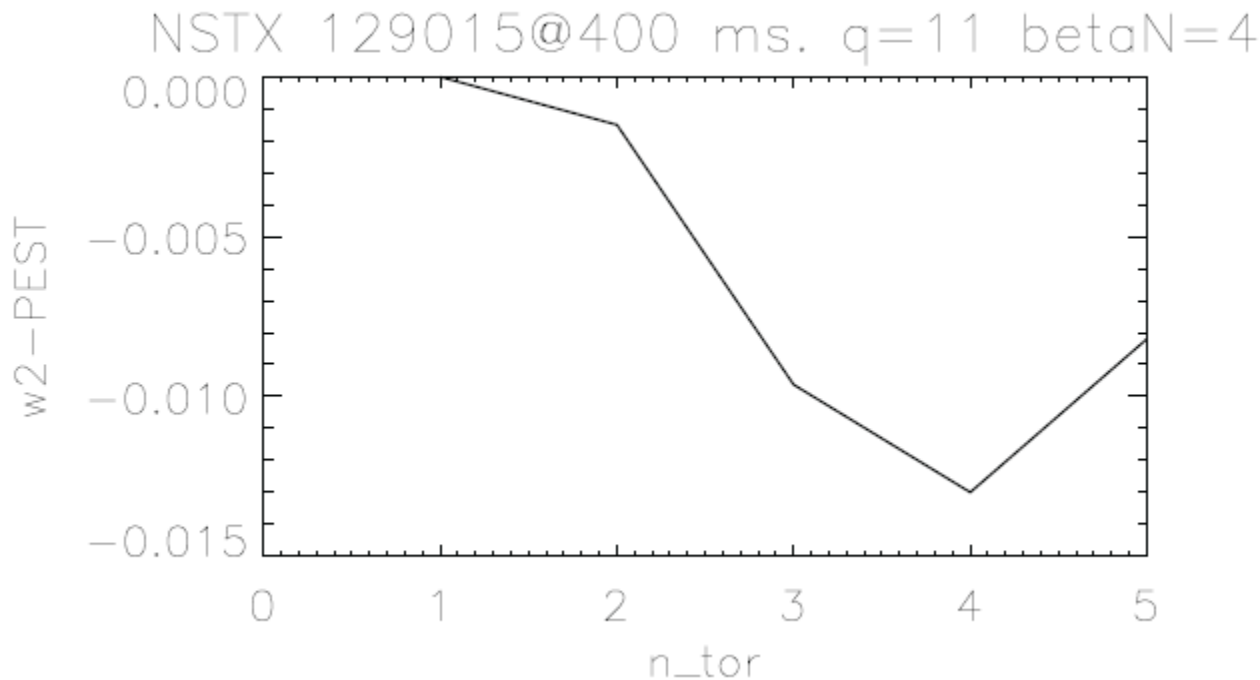
- DIII-D n=3 RFA has been successfully measured using oscillating field
- Complex behaviors are shown, but successfully benchmarked with MARS-F (not yet fully with IPEC)

EXP. vs. IPEC



NSTX n=3 RFA has not been tested, and theory shows high-n may be more unstable

- NSTX n=3 (or n=2) RFA has not been tested
- PEST-II calculations showed n=3-4 may be most unstable in NSTX, implying that RFA may be also a strong function of present β -range



Shot plan (0.5~1 day)

- Use high- β target shots with $n=1$ RWM feedback
 - High performance shots are desired
- Add $n=2$ rotating fields with +30Hz, -30Hz
 - If successful, scan frequencies, 0, 60Hz
 - With the most favorable frequencies, scan NBI power, 4-6MW
- Add $n=3$ oscillating fields with +30Hz, -30Hz
 - If successful, scan frequencies, 0, 60Hz
 - With the most favorable frequencies, scan NBI power, 4-6MW