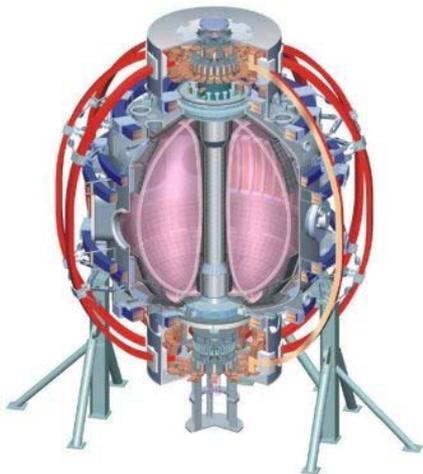


XP proposal :

ELM Triggering with with $n=1$ or $n=2$ Field

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and the NSTX Research Team**

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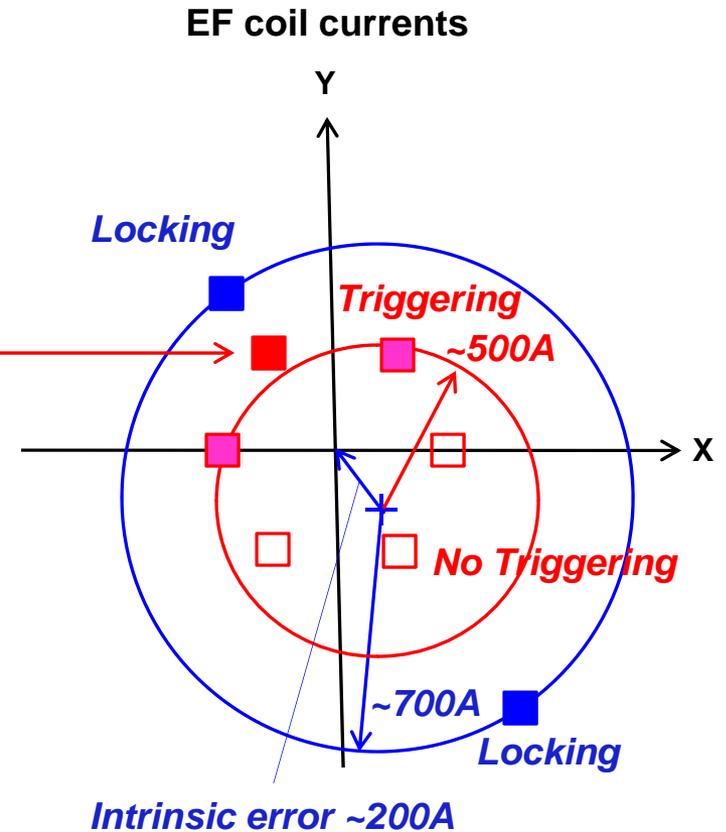
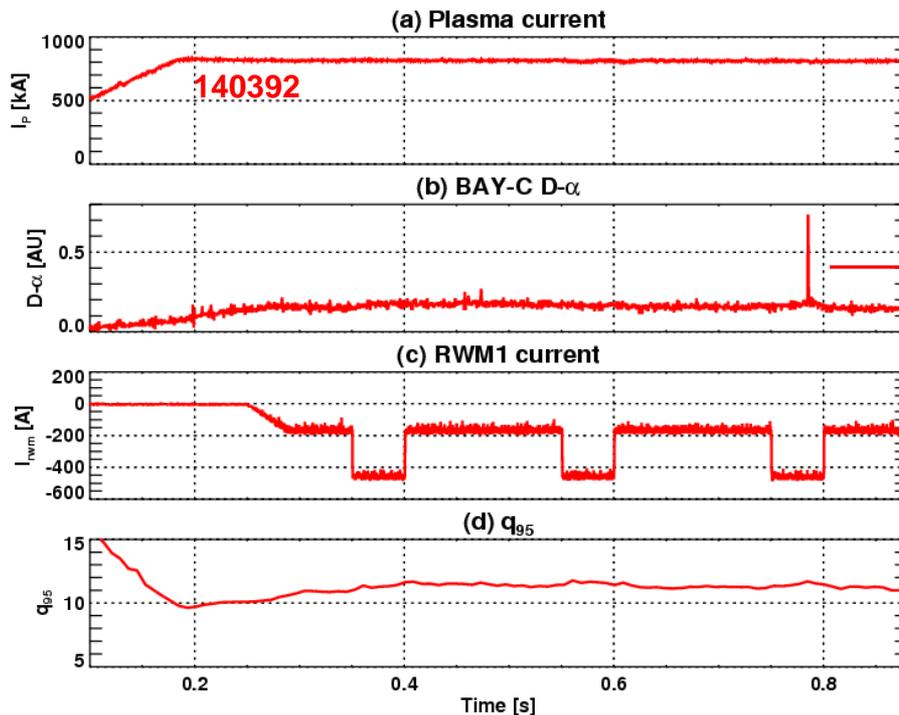
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Motivation

- During the 2010 campaign, ELM triggering was observed with $n=1$ field
 - EF $n=1$ with $\sim 500\text{A}$ triggered ELMs (Locking thresh. $\sim 700\text{A}$)
- Verification of this observation is needed
 - Systematic scan with q_{95} will be useful as done for $n=3$
- If verified, it may imply that NSTX ELM triggering is not sensitive to 3D field spectrum at all
 - A single EF coil can make all different n , and can be tested for ELM triggering

ELM triggering was observed with n=1

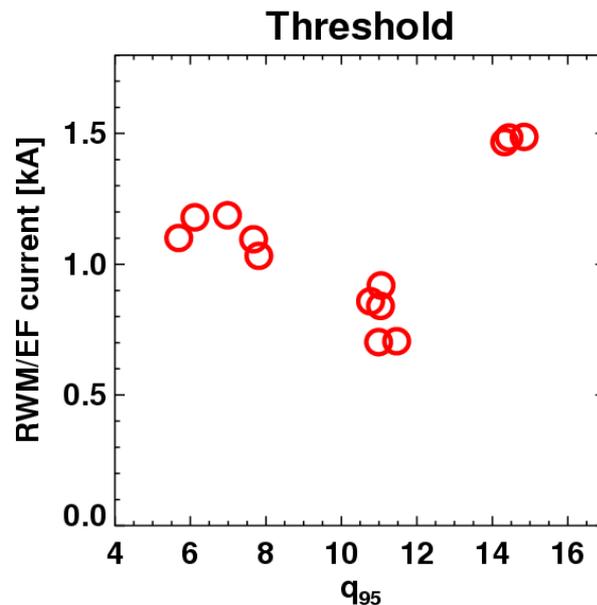
- ELMs were triggered even with n=1
 - Considering intrinsic errors, ELM triggering threshold $\sim 500\text{A}$ (Locking threshold $\sim 700\text{A}$)



Systematic scan is needed to verify this observation as done for n=3

- ELM triggering vs. q_{95} can be tested for n=1 systematically as done for n=3
 - Optimum q_{95} exists for n=3 ELM triggering (XP1048)
 - If different trends are found, n=2 can also be tested
 - If similar trends are found, ‘resonance’ argument with specific n-number may be not so meaningful

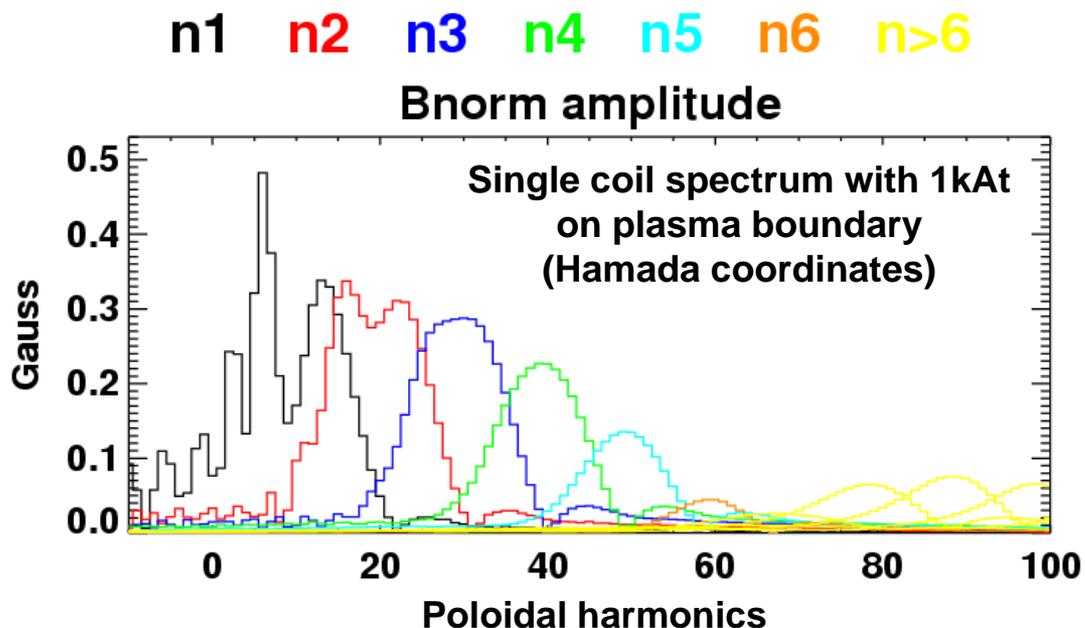
n=3 current threshold for ELM triggering



3D field spectrum may be not so important

NSTX ELM triggering

- If $n=1-3$ shows similar ELM triggering trends, it may imply that 3D field spectrum is not important at all
- A single coil application can be tested using 2nd SPA
 - A single EF coil will produce complicated 3D fields



Shot plan (0.5~1 day)

- Reproduce $n=1$ ELM triggering vs. q_{95}
 - Use XP1048 for target plasmas with different q_{95}
 - Apply 400,500,600A,... (50ms) for each target
 - EF [-1,-1,0,1,1,0] is preferred, for alignment with intrinsic EF
 - If different trends are found, test $n=2$
 - Amplitudes should be higher than $n=1$, but smaller than $n=3$
 - Otherwise, test a single coil application using 2nd SPA
 - Use optimal q_{95} target
 - Test various ELM pacing
- * This XP requires large LITER evaporation