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XP1031: MHD/ELM stability dependence on thermoelectric J, edge J, and collisionality

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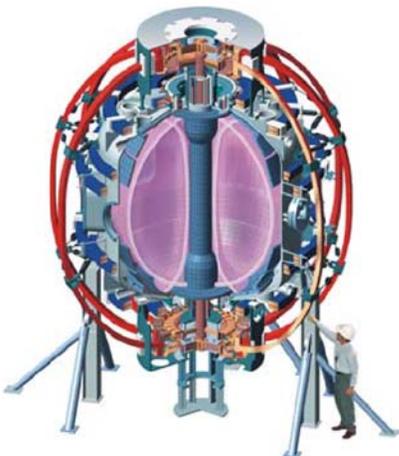
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NSTX Physics Meeting

June 7th, 2010

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Target conditions set-up for XP1031: MHD/ELM stability dependence on thermoelectric J , edge J , ν

● Goals/Approach

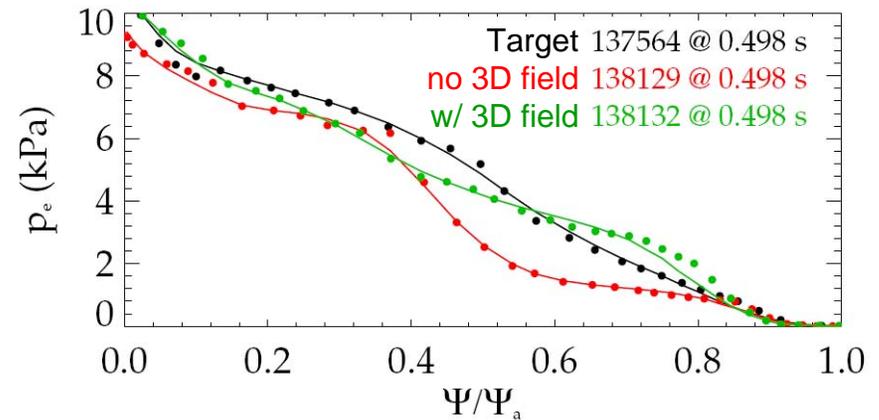
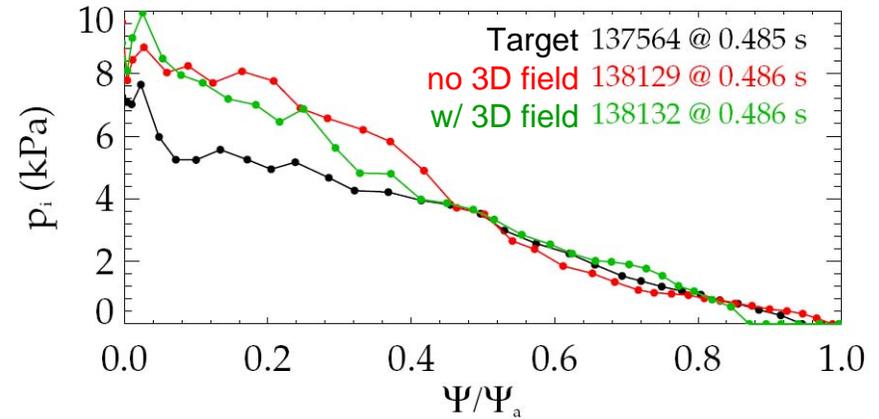
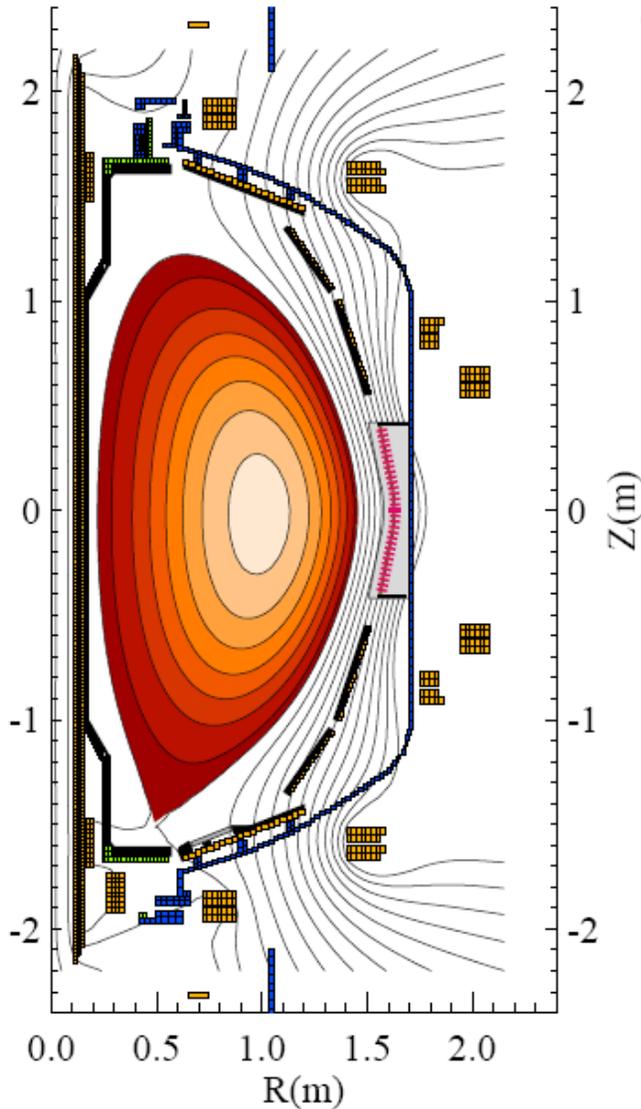
- Test expectations ELM stability theory considering changes to edge toroidal current density, field-aligned thermoelectric current, and collisionality
 - 1) Generate target
 - 2) Vary TE current connection length at fixed 3D field
 - 3) Vary 3D field amplitude
 - 4) Vary toroidal current density near the edge
 - 5) Vary collisionality with LLD

● Data from last week

- Completed Step (1), using target from LLD XP1000 (4 shots / 2 good shots)
 - intermediate elongation and triangularity successfully re-created using strike point control
 - small evidence of ELM activity, dithering, indicating marginal stability of ELMs
 - 50 Hz $n = 3$ field applied to the plasma, yielded ELMing plasma during $n = 3$ field
 - Scrape-off layer currents were measured by the new LLD shunt tiles and Langmuir probe arrays



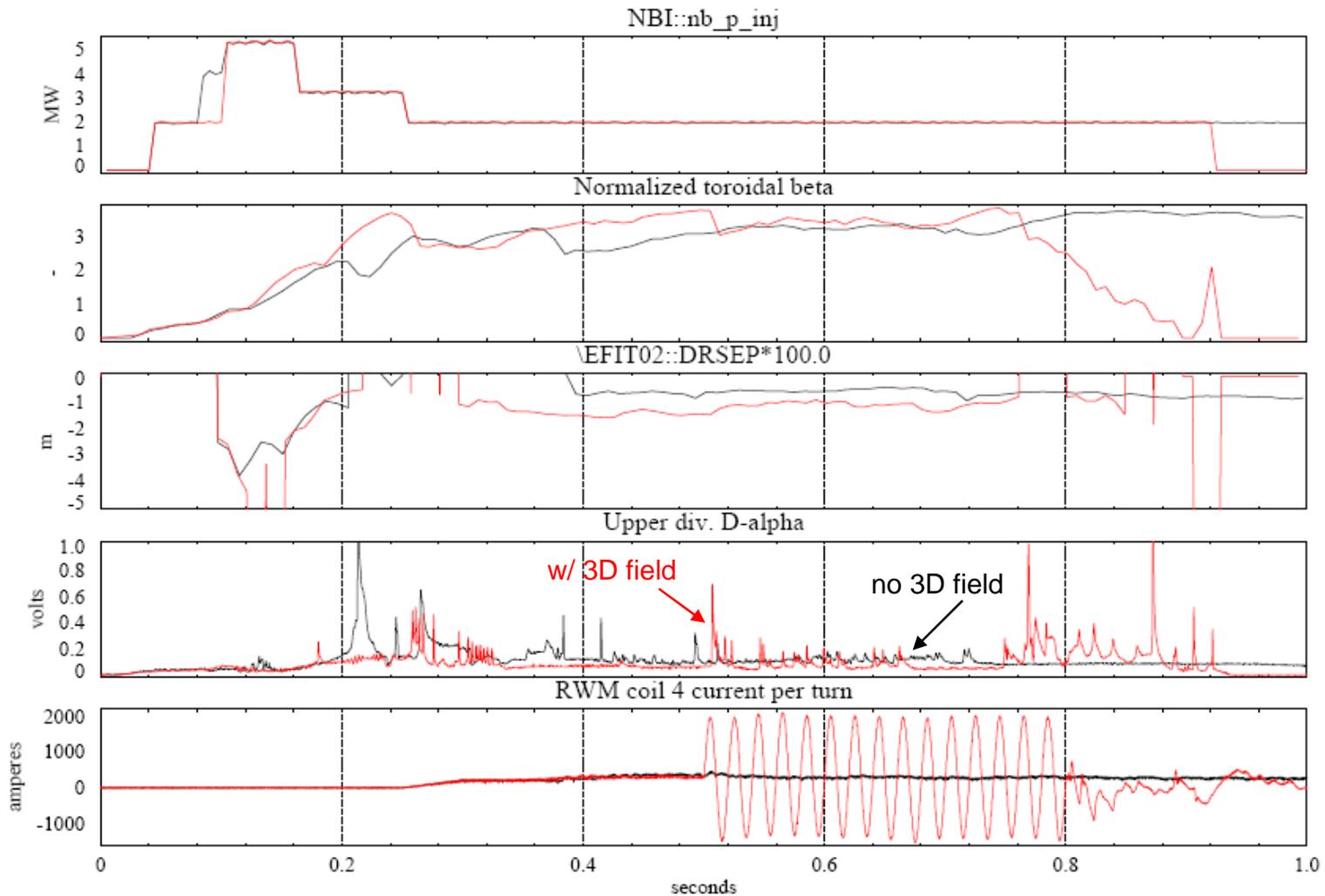
Target configuration reproduced, some changes in profiles



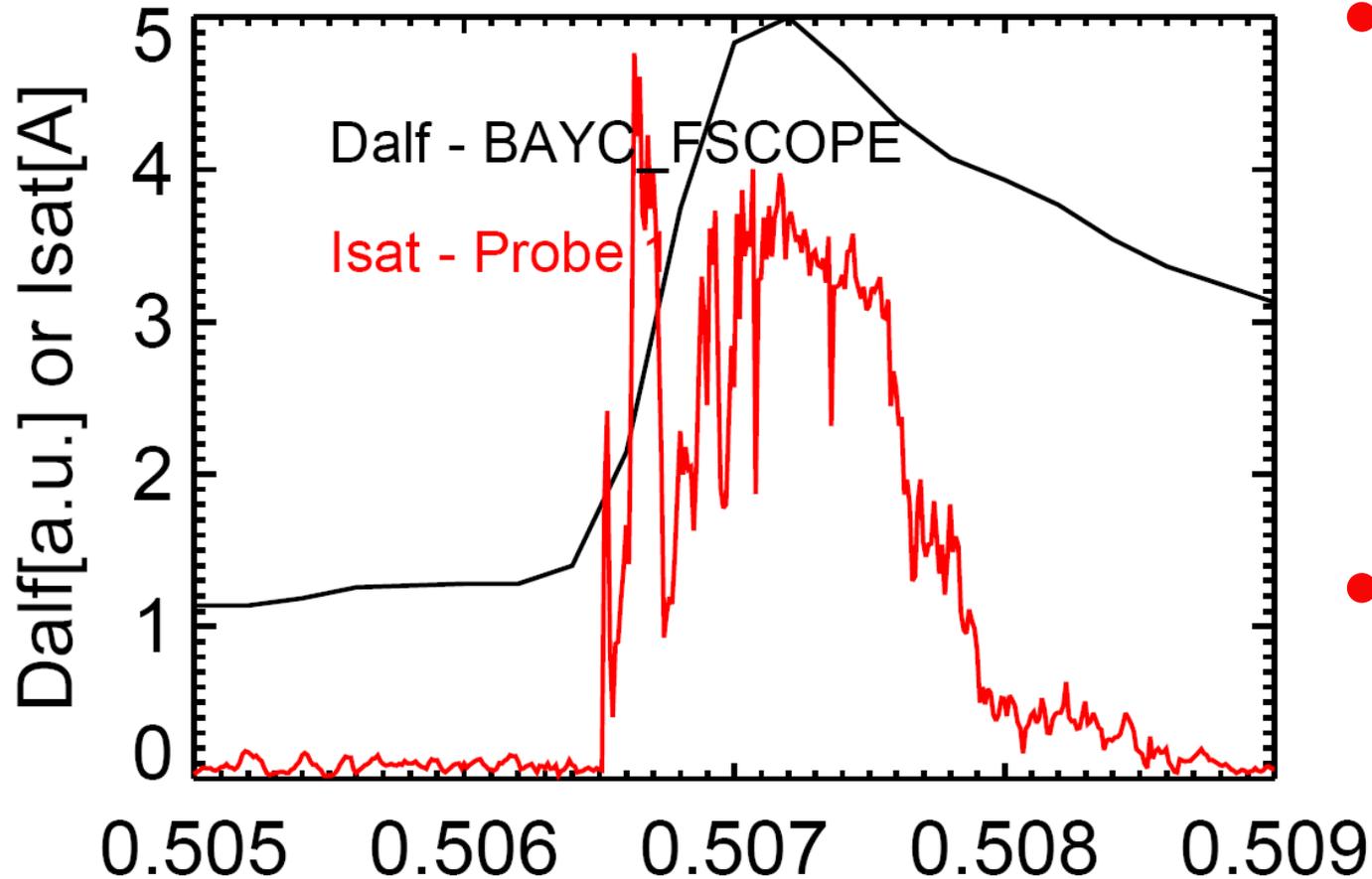
Profiles taken at same time, but had somewhat different β

□ Examine further, choose profiles at same β

ELMs generated when 3D field was applied



Scrape-off later currents during ELMs measured by LLD shunt tiles and Langmuir probe array



- Langmuir probe current
 - Measured during ELM generated after application of 3D field
- Similar data taken with LLD shunt tiles