NSTX

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Imaging 3D edge island structure in NSTX

D.J. Battaglia[1*], J. Canik[1], R. Maingi[1], R. Maqueda[2]

[1] Oak Ridge National Laboratory, Oak Ridge, TN

[2] Nova Photonics, Princeton, NJ

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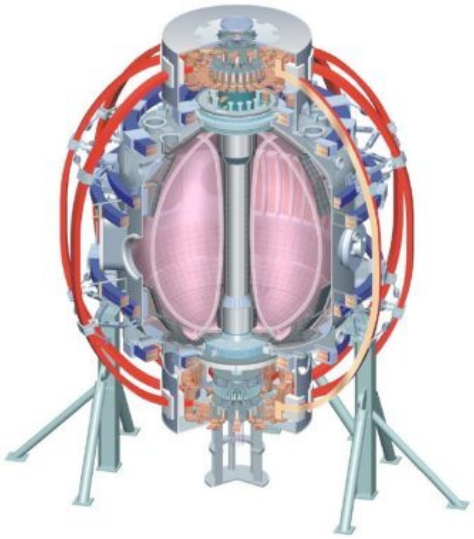

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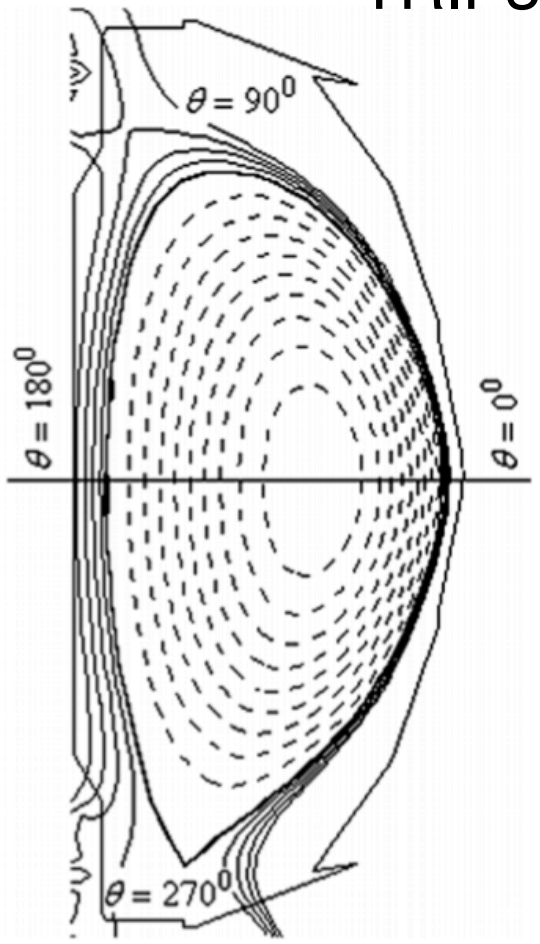
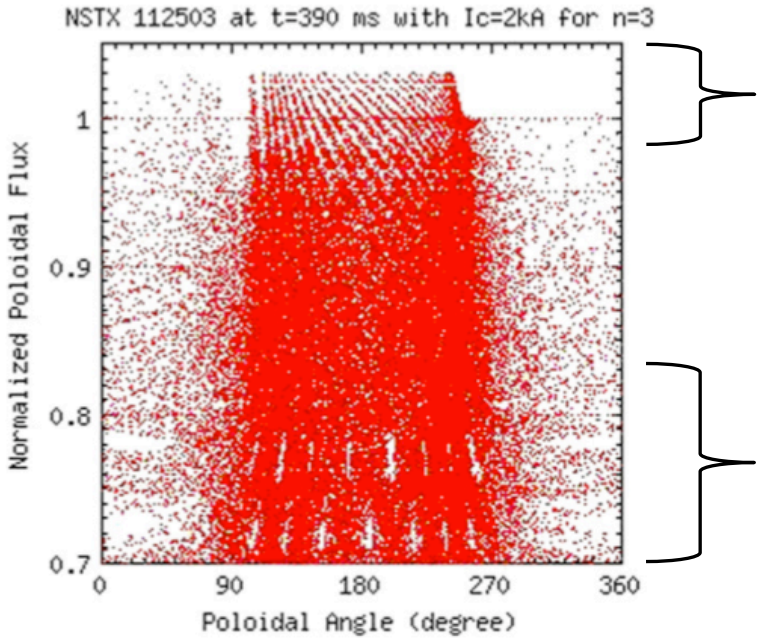
3D field perturbation predicted to form edge island structure

TRIP3D calculations for n = 3 applied field



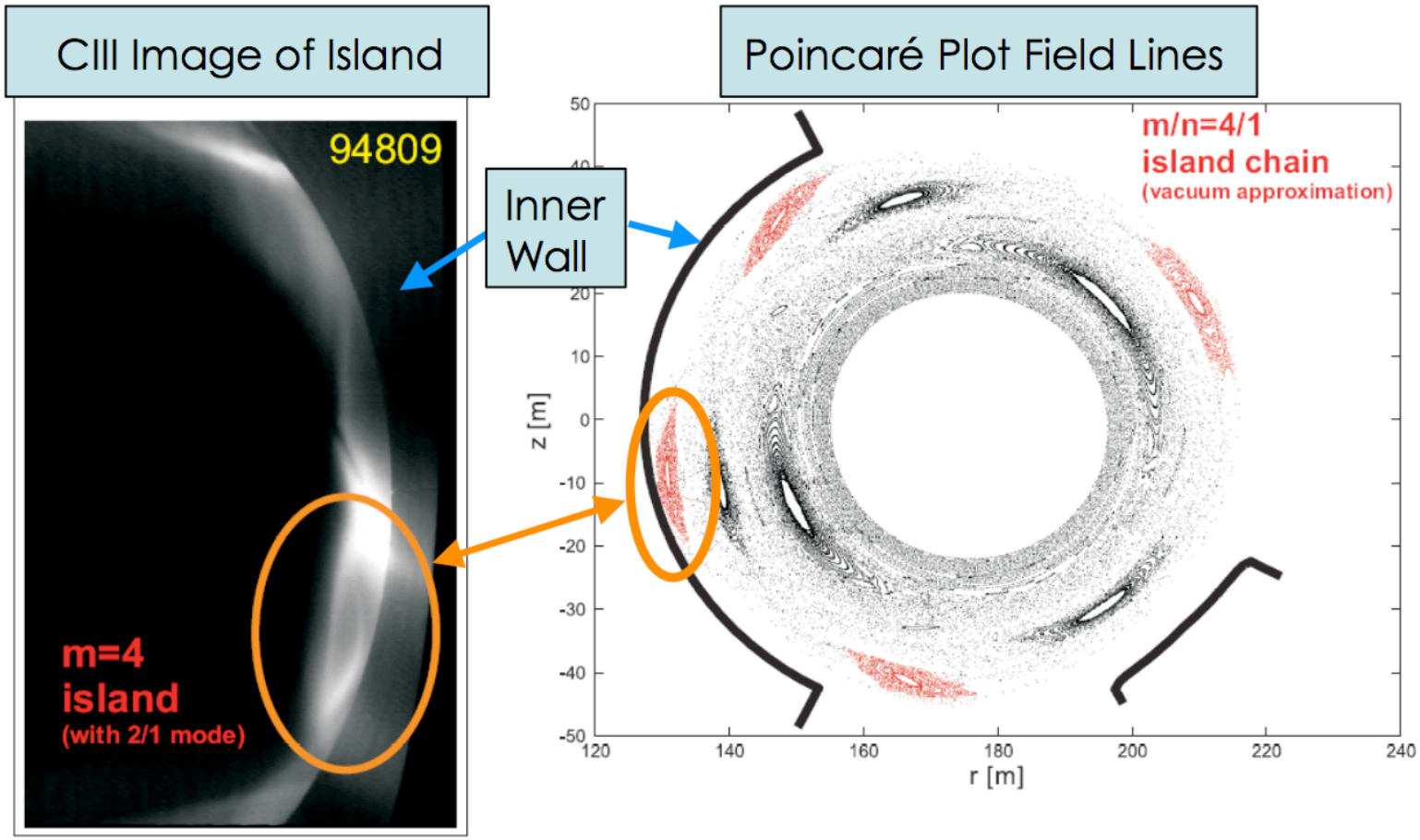


Edge striations imaged using visible

Edge islands that could be imaged using SXR

Yan, L. et. al., Nucl. Fusion **46** (2006) 858-863

TEXTOR experiments image edge island structures using CIII filtered visible camera



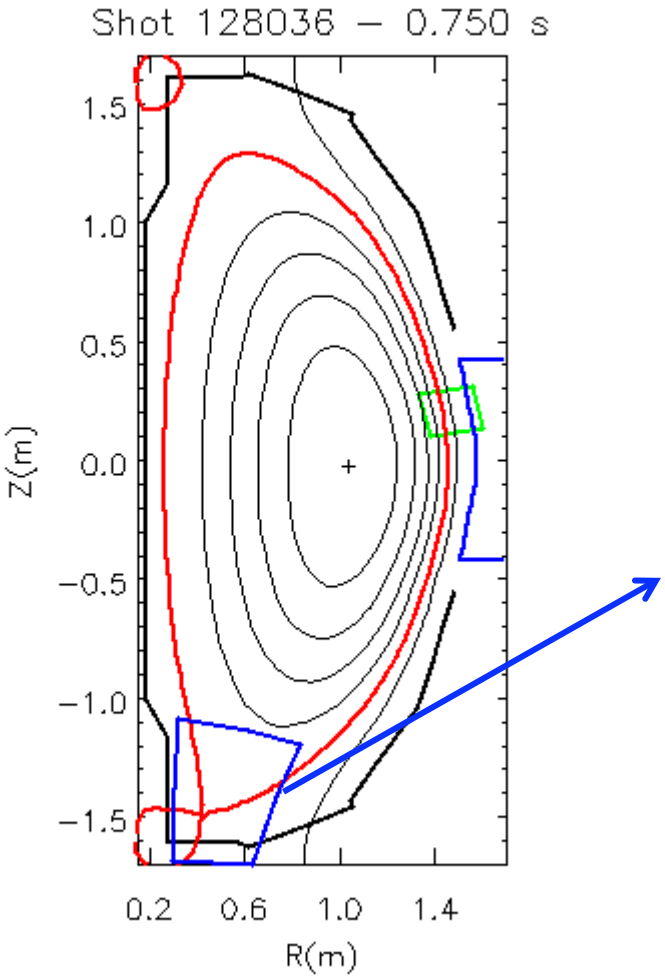
CIII filtered visible image of an edge island agrees with the vacuum model

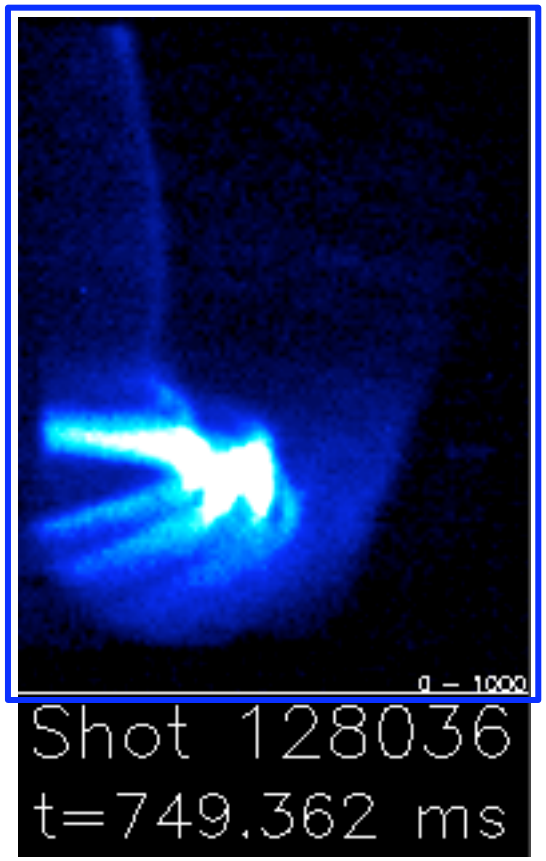
Image edge islands using CIII filtered visible camera in order to benchmark vacuum field calculations

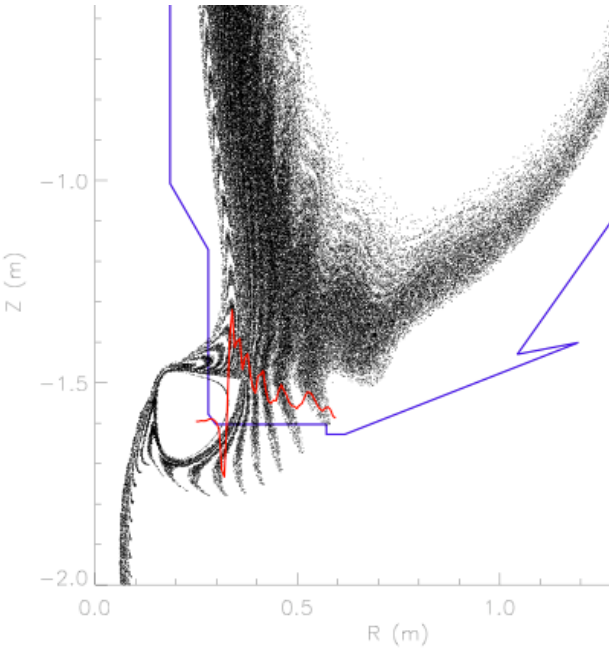
- Use CIII filtered visible camera to image edge structure
  - Use view near X-point where flux expansion is greatest
    - Islands / striations are small (width ~ few cm)
  - CIII bright and should originate near bottom of pedestal
    - Compare to vacuum calculations (small effect from plasma response)
    - Set the stage for SXR imaging that probes deeper where plasma response is significant

- Propose 1/2 day experiment
  - Nearly ELM-free discharge with constant 3D perturbation
    - Perturbation will have to be small enough not to trigger many ELMs
  - Vary n=1,2,3, phasing and q_{95} to alter position of islands
  - Use CIV or OV filters with long exposure for deeper imaging depth
  - Piggy-back on other 3D experiments (Ahn et. al., q_{95} scan)

Previous CIII imaging indicates sufficient emission brightness to make measurement







CIII filter
96 x 128 pixels
70175 fps
12 μs exposure

600 x 800 pixels
~ 2000 fps
up to 0.5 ms exp

~ 6 times signal gain