NCSX stay out zone update

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NCSX Engr Meeting

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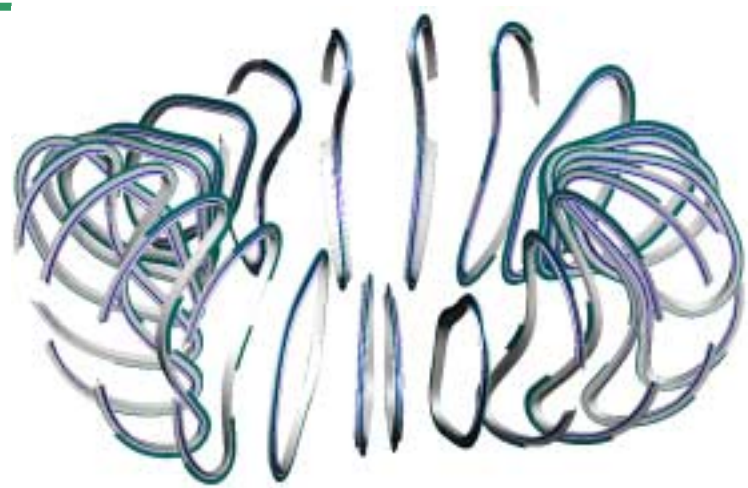
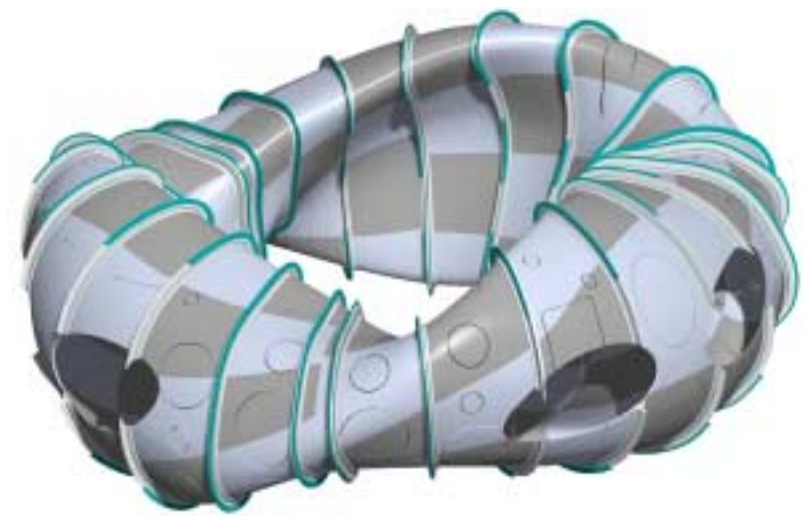
PFC design concept

- **Staged implementation planned**
  - **Initial coverage with low Z tiles mounted on poloidal ribs to form array of poloidal limiters**
  - **Panels for NB armor will also be provided**
- **Full coverage provided by mounting molded carbon fiber composite (CFC) panels on poloidal ribs**
  - **Panel size based on advice from BFG aerospace (~ 60 cm square, 1 cm thick)**
- **Ribs are separately cooled / heated with He gas for bakeout (350C) and normal operation**
- **Ribs are registered toroidally to VV but allowed to grow radially and vertically**

Poloidal ribs



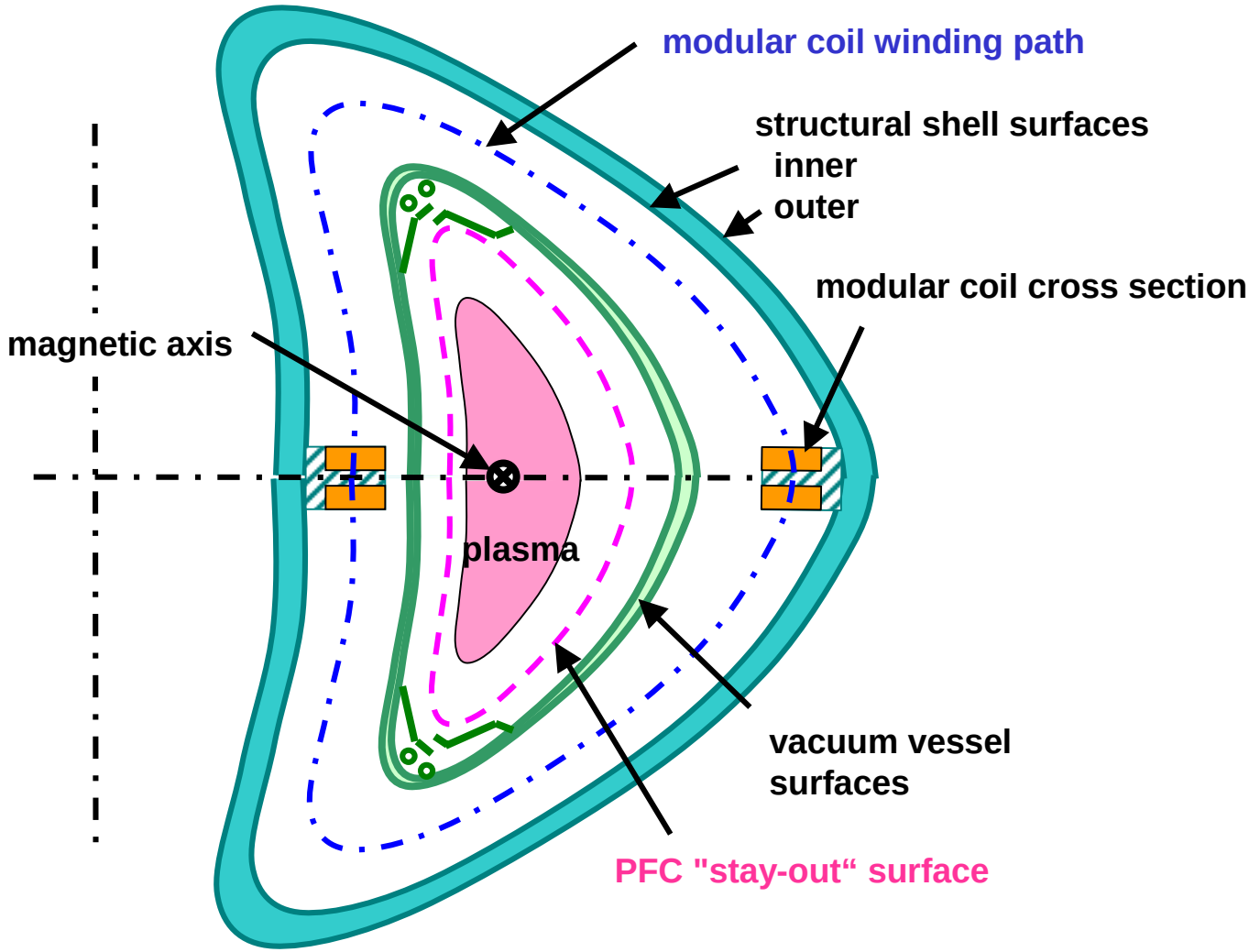
CFC panels mounted on poloidal ribs



PFC issues

Requirements	Design	Fab.	Ass'y
• PFC stayout zone • NBI armor location • divertor parameters • Limiter geometry • In-vessel diagnostics (e.g., magnetic loops)	• pumped divertor envelope • transition from day 1 to full coverage • RF launcher integration with limiters, diag. • trim coil integration • low z rail covers • inboard limiter concept	• CFC cost • Low z coating	• personnel access for –installation –reconfiguration

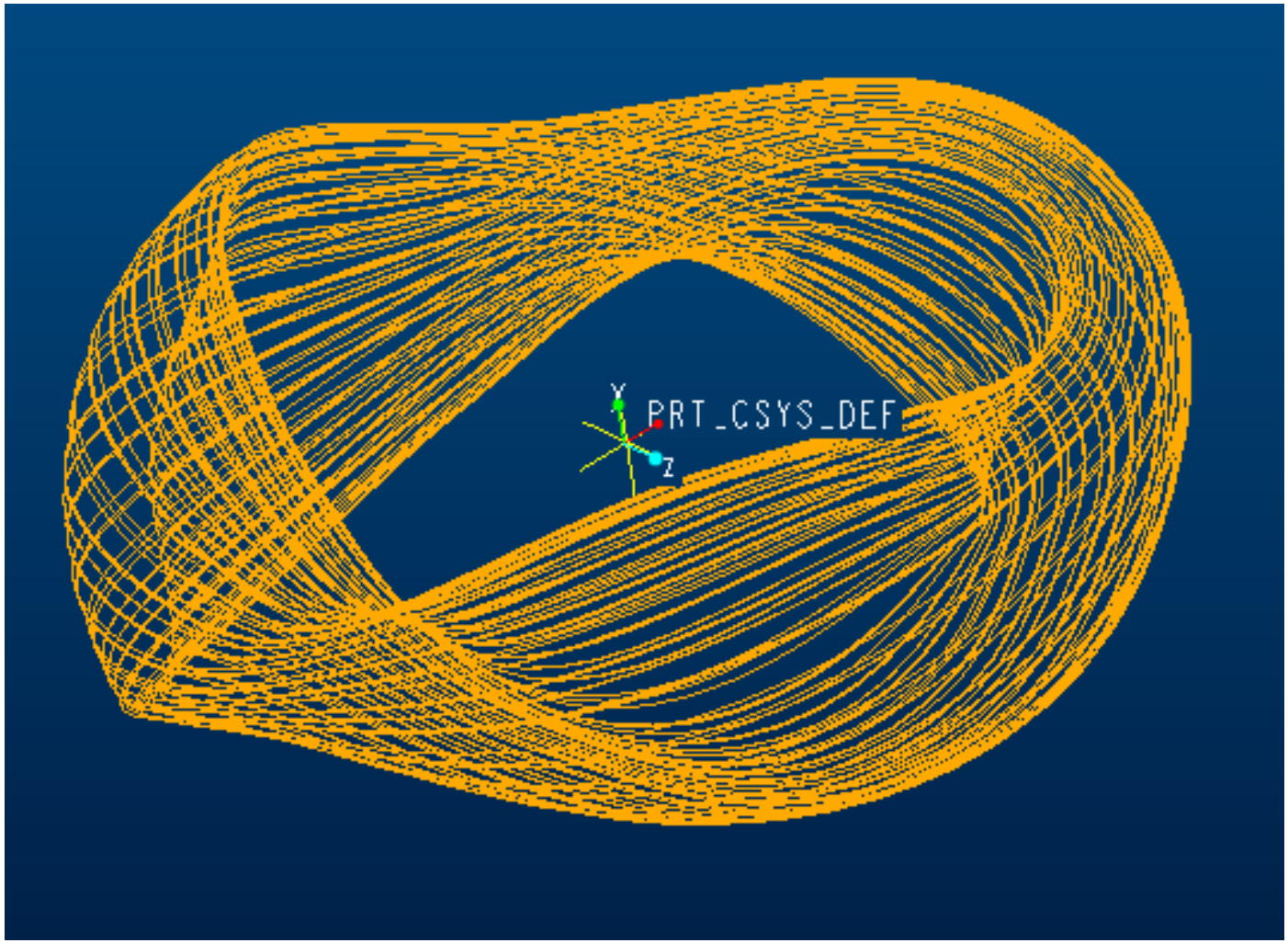
Reference geometry must be defined



“Stay out zone”

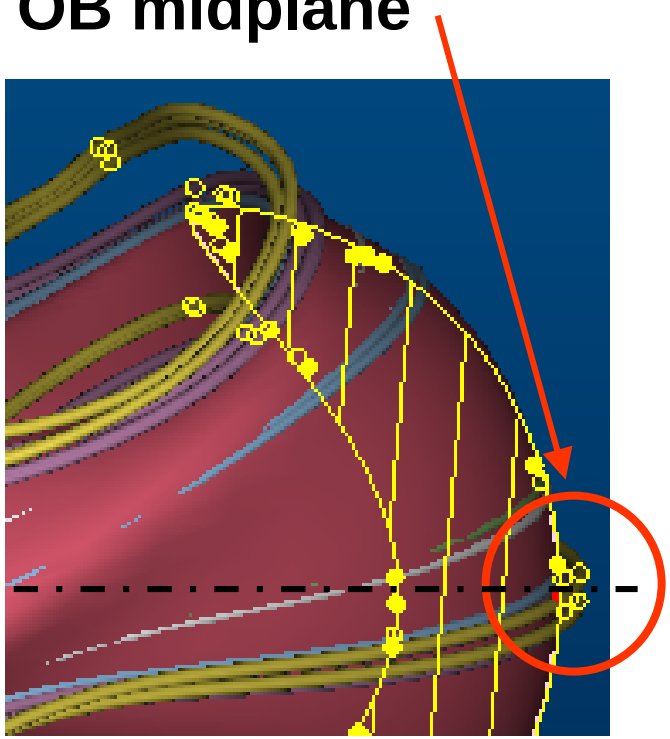
- **Art Grossman has field line data for MGRID_Li383_1017C2**
- **Initial data has been scaled by 0.82**
- **Initial task has been to plot field lines in 3-D space using Pro-E for visualization**
- **Art today sent new data for 1.4 m case**
- **Issues include:**
  - **Where do we start the field lines? (if we start on last closed surface, they stay nicely on the surface)**
  - **How do we account for “flexibility” in the envelope?**

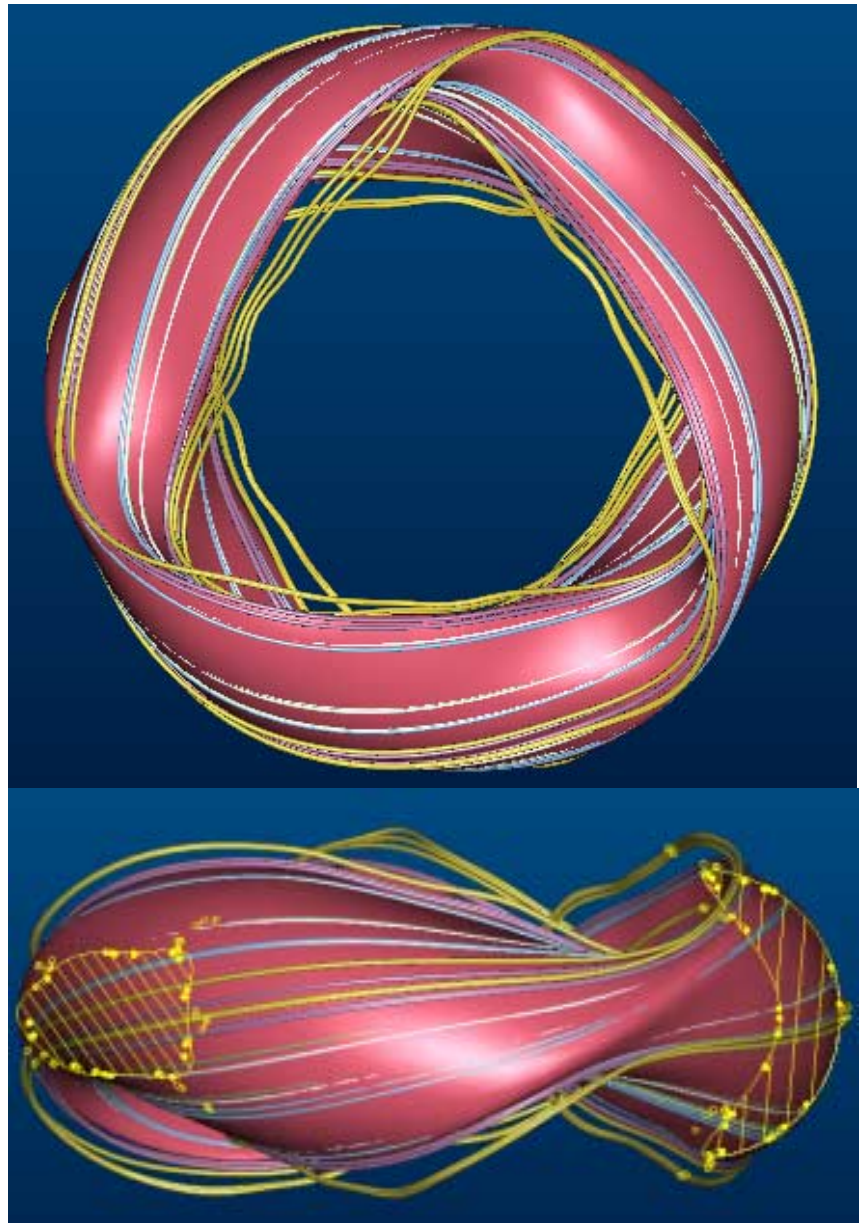
Field line starting at OB midplane



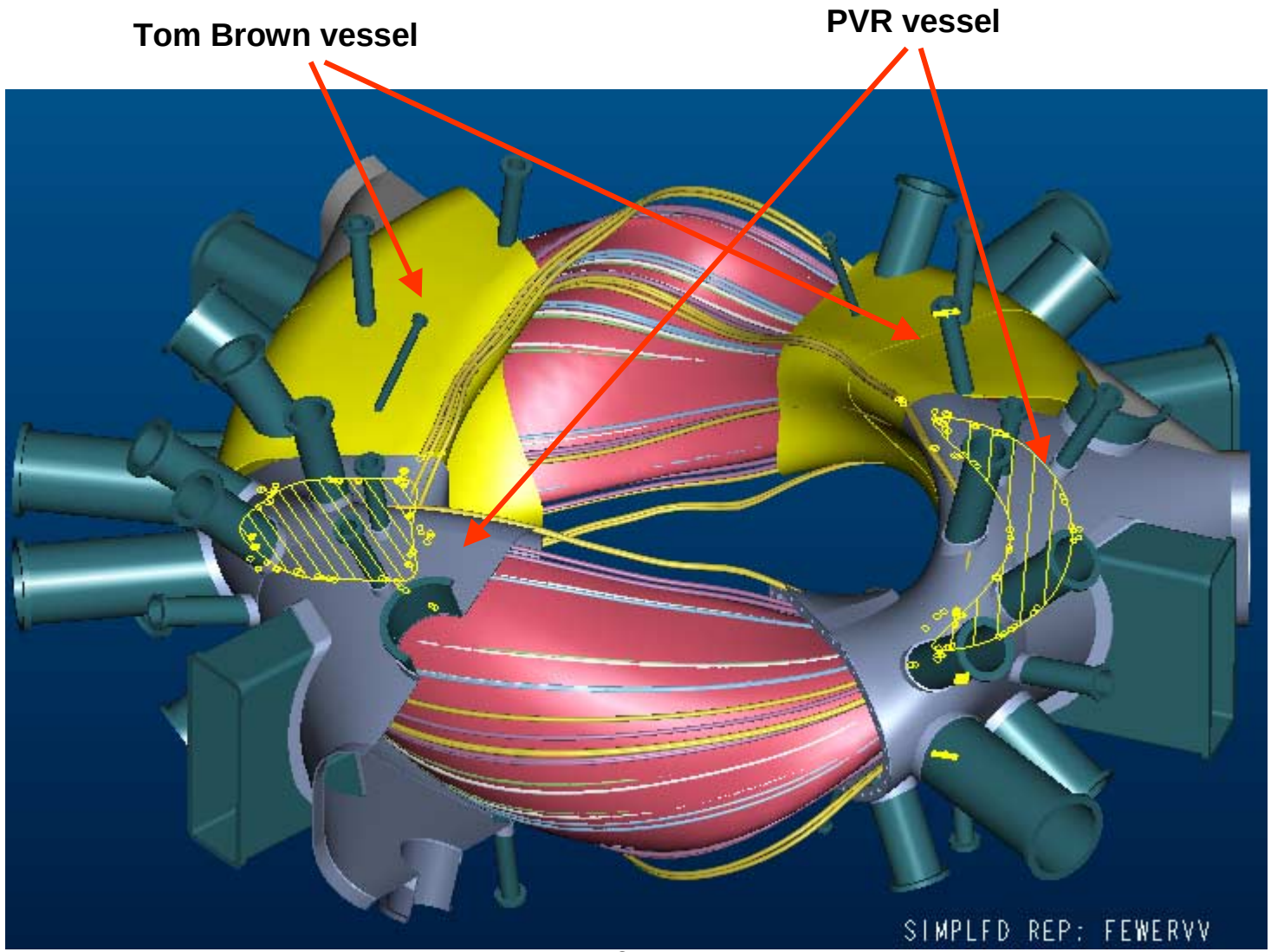
Field lines started outside LCMS

- **Plotted for 0, 0.2, 0.4, 1.8, and 3.8 cm offsets from OB midplane**

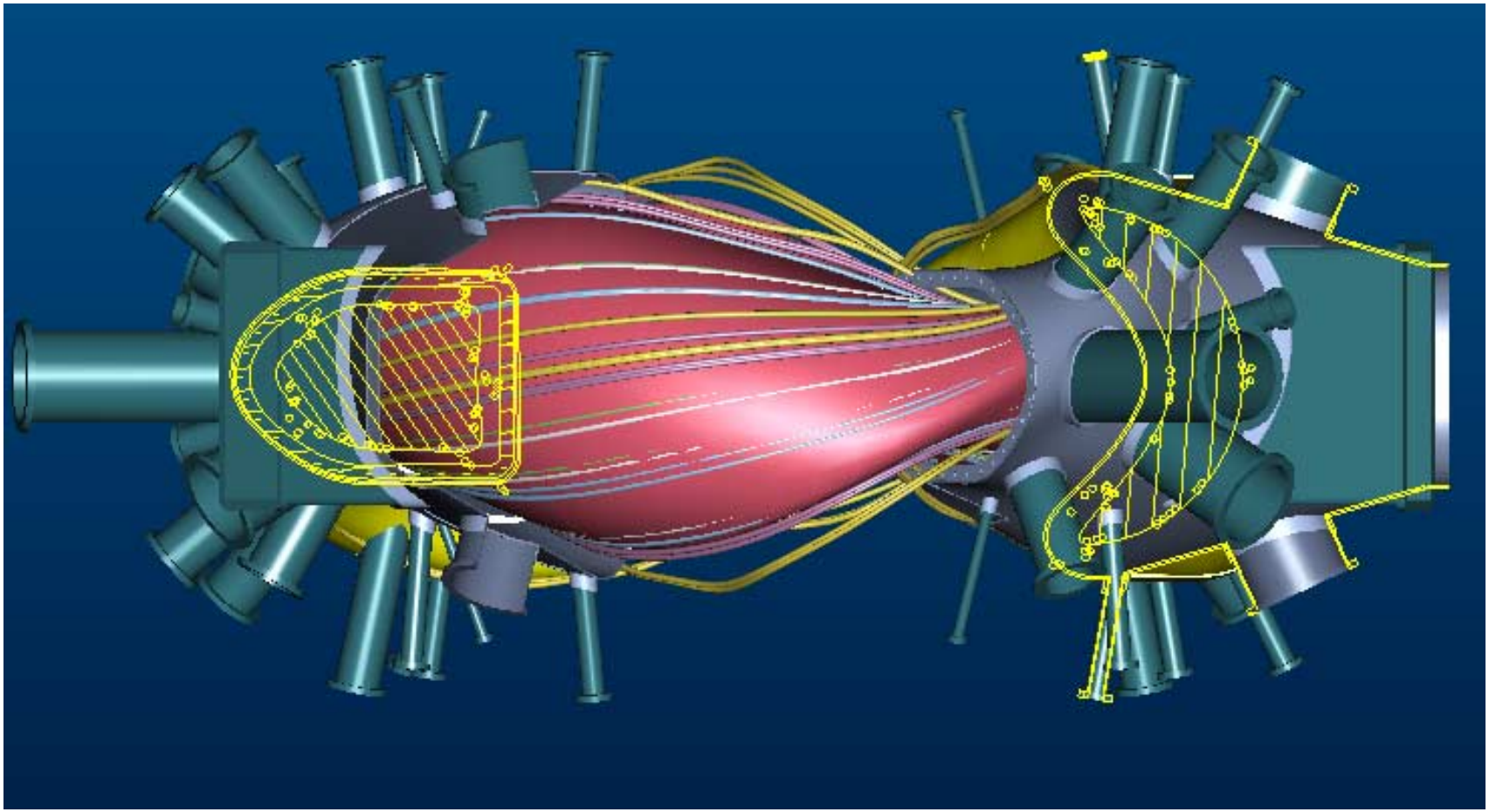




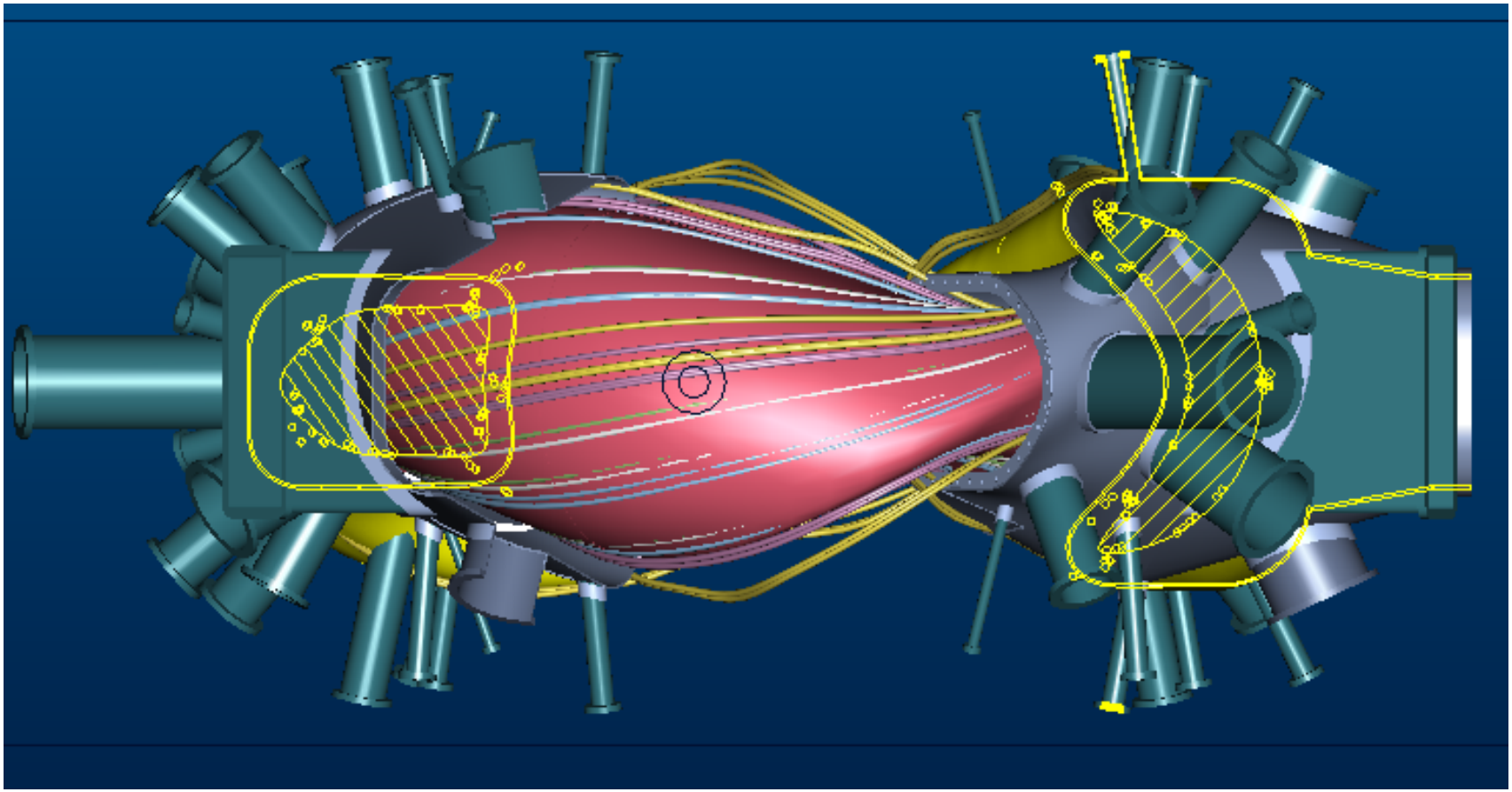
What about vessel boundary?



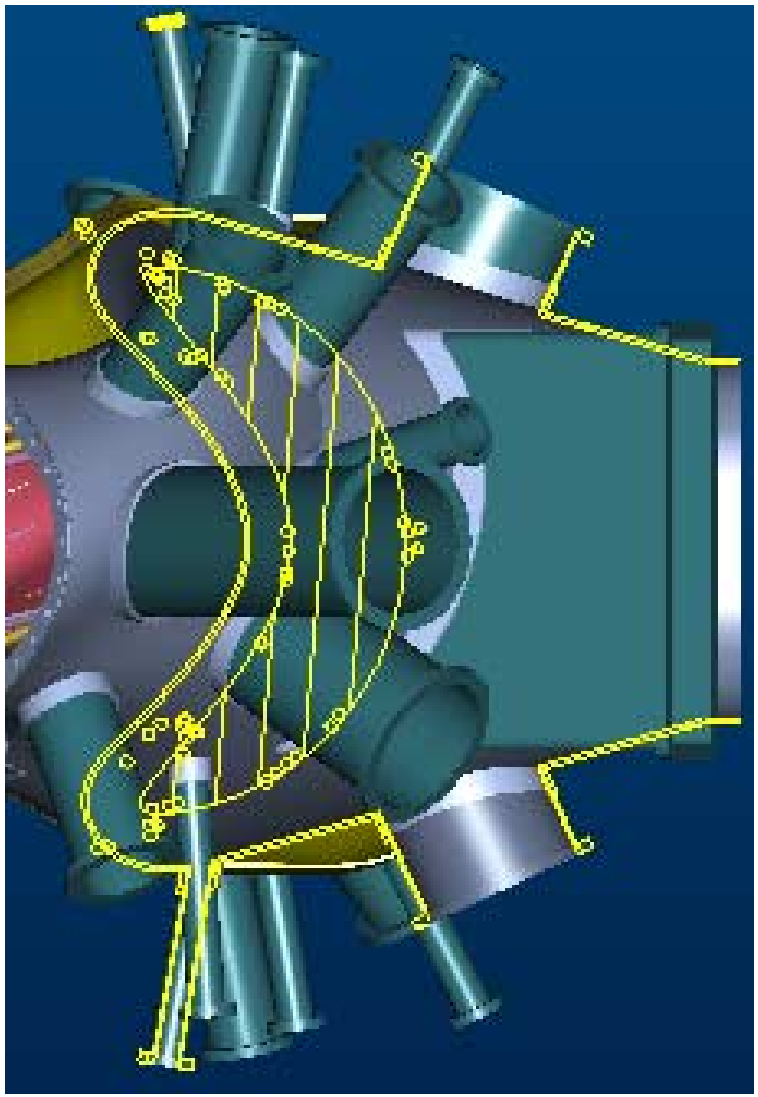
Section with respect to PVR VV

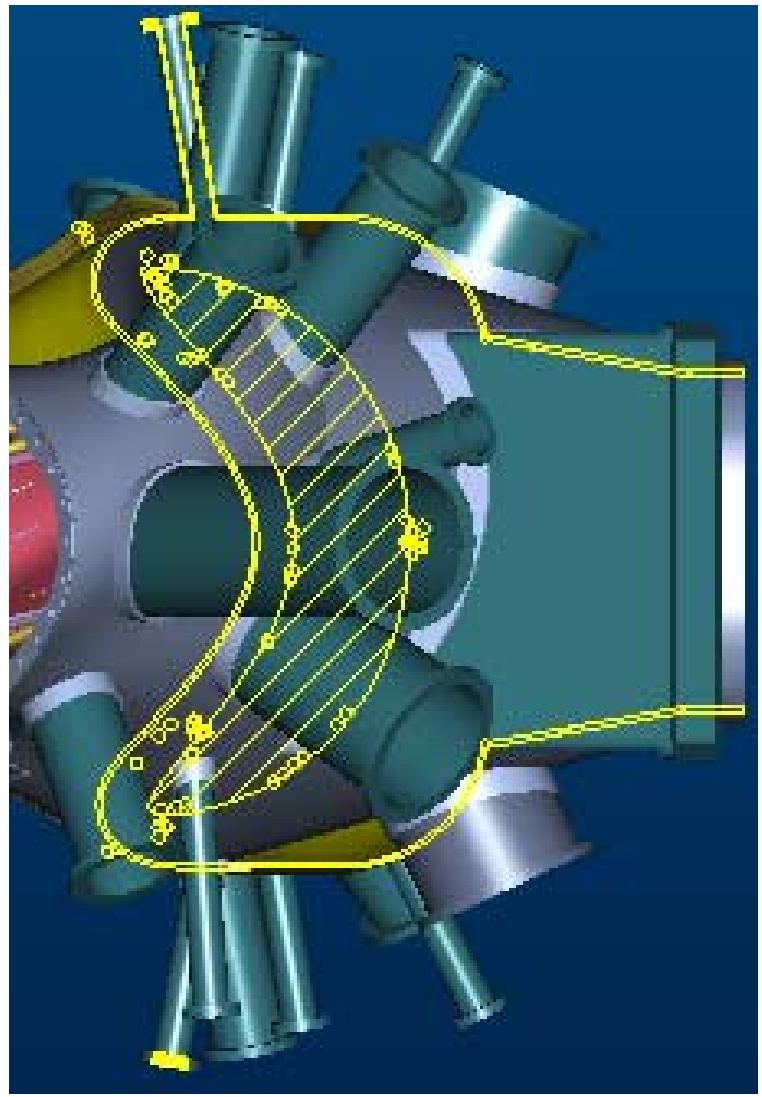


Section with respect to TB VV

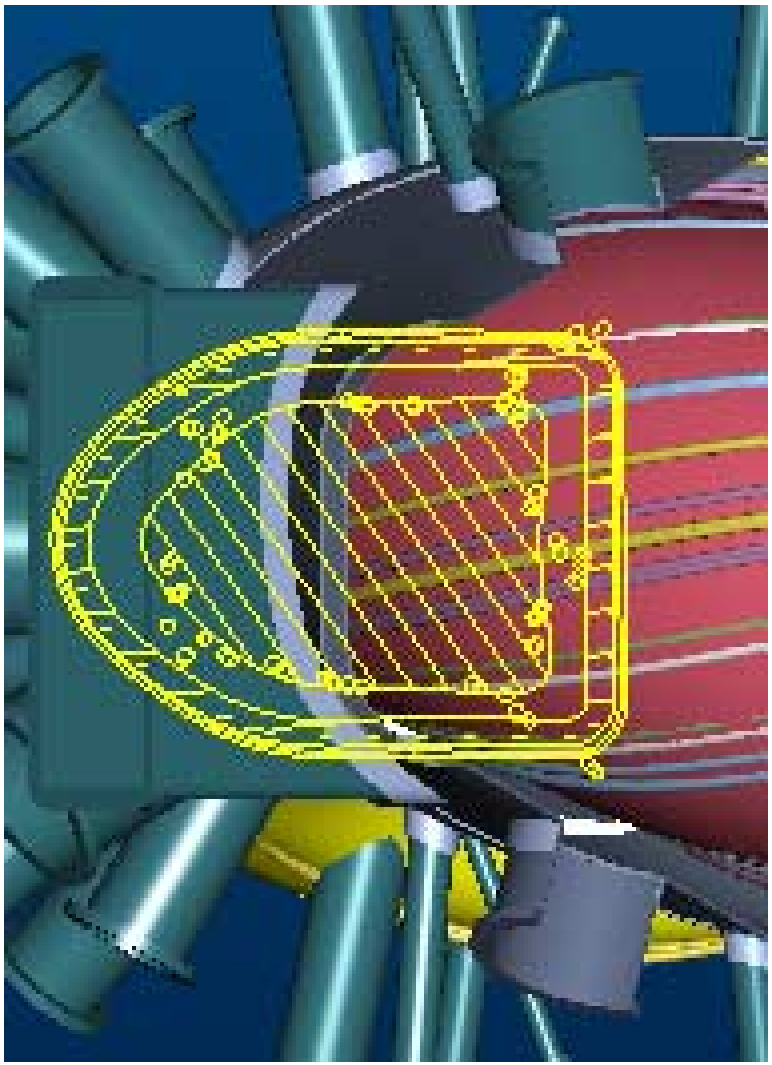


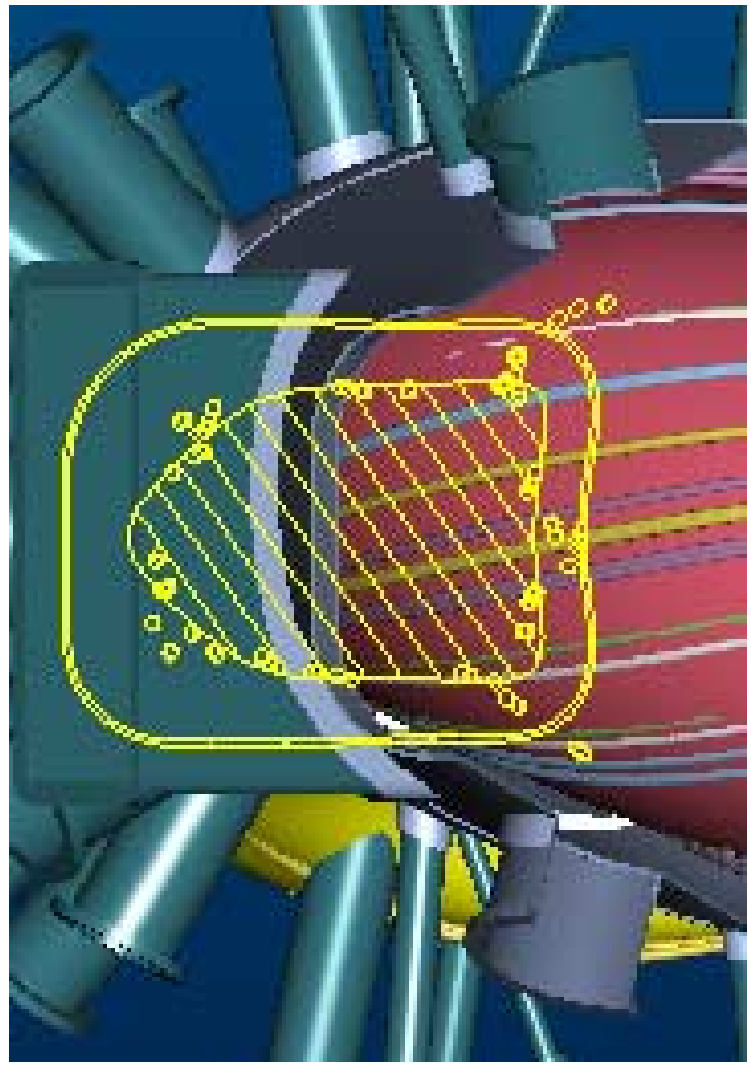
PVR vs TB VV at bean section



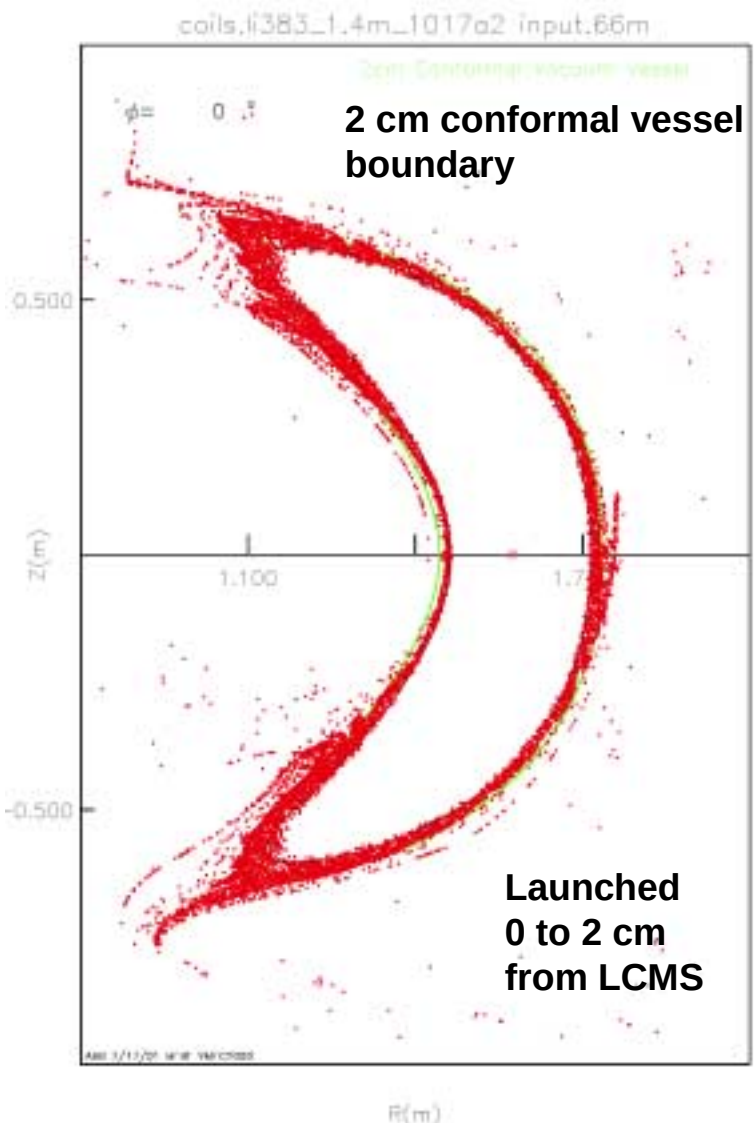


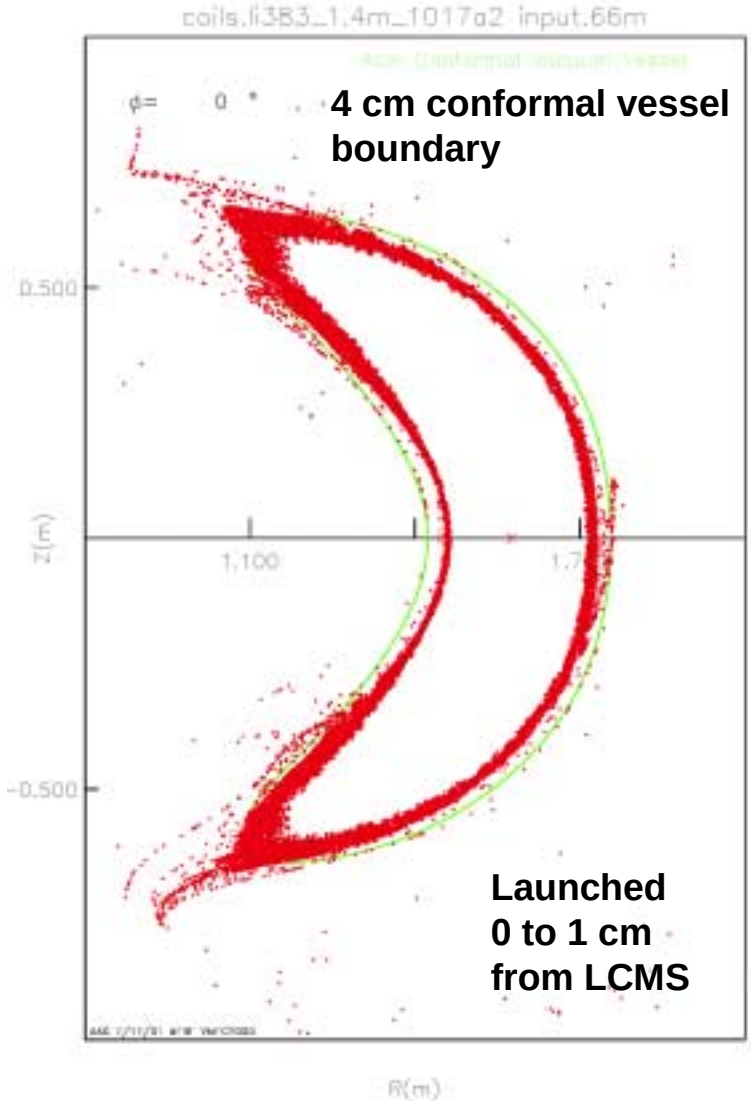
PVR vs TB VV at bullet section



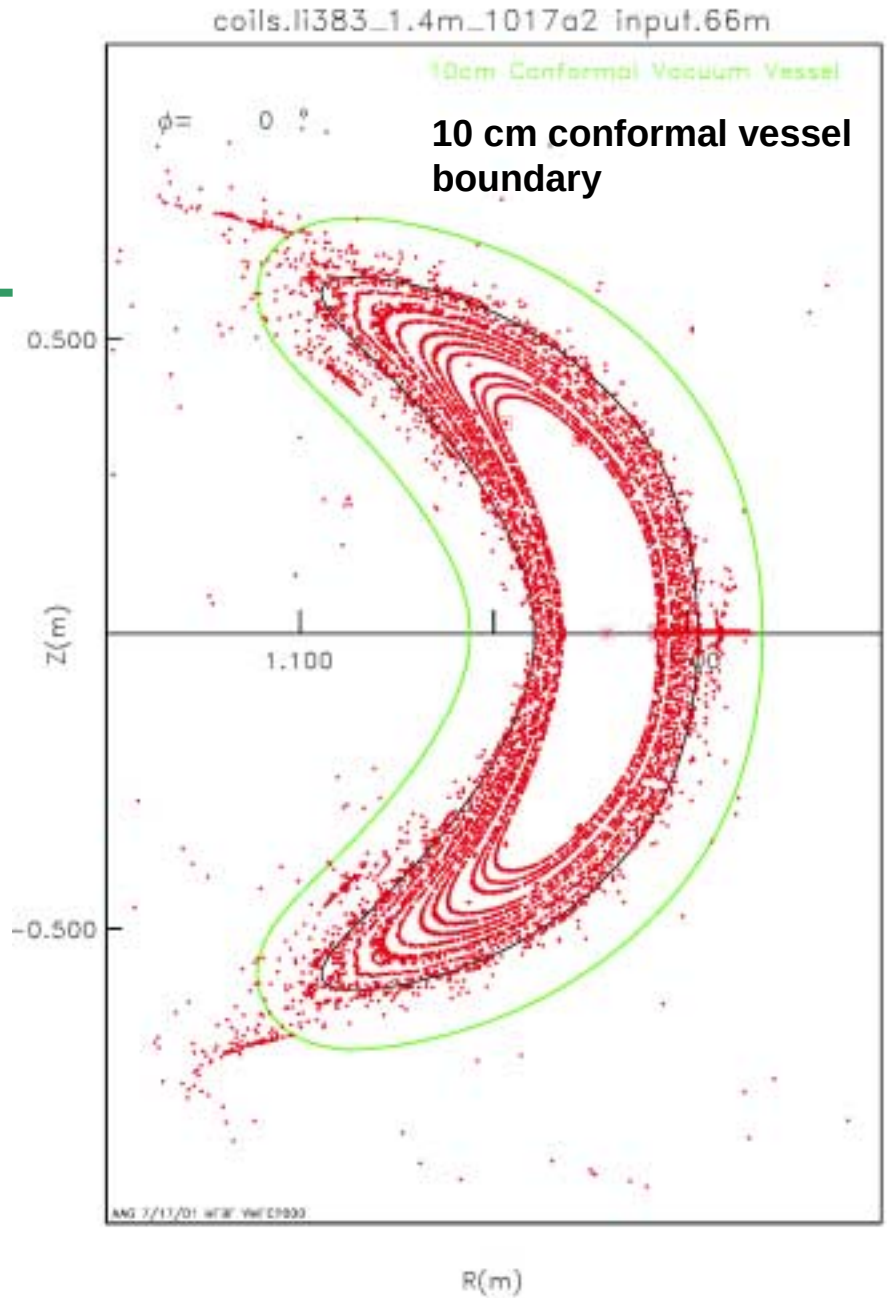


60 field lines from 1.4m run (Art G)





30 lines, +/- 5 cm from LCMS OB



VV / PFC deliverables

milestone		deliverable		who	when
5	update concept of VV/PFCs	5a	Define "stay-out" surface for PFCs (scrape-off layer using VMEC that includes expansion of divertor region, outboard region?)	P. Miodu-szewski	23-Jul-01
		5b	Define day 1 limiter requirements	P. Mio.	Draft 6/1
		5c	Define day 1 divertor baffle requirements	P. Mio.	Draft 6/1
		5d	Define inboard RF launcher envelope	Cole/ Majeski	Draft 6/12
		5e	Define VV assembly joint envelope and seal concept	Cole/ Goranson	
		5f	Define day 1 rail "covers" / limiters concept	Goranson	
		5g	Define trim coil attachment/alignment concept	Brown/ Cole	
		5h	Issue models and drawings of VV/PFC concept	Cole	