

pfRICH Engineering Design Update

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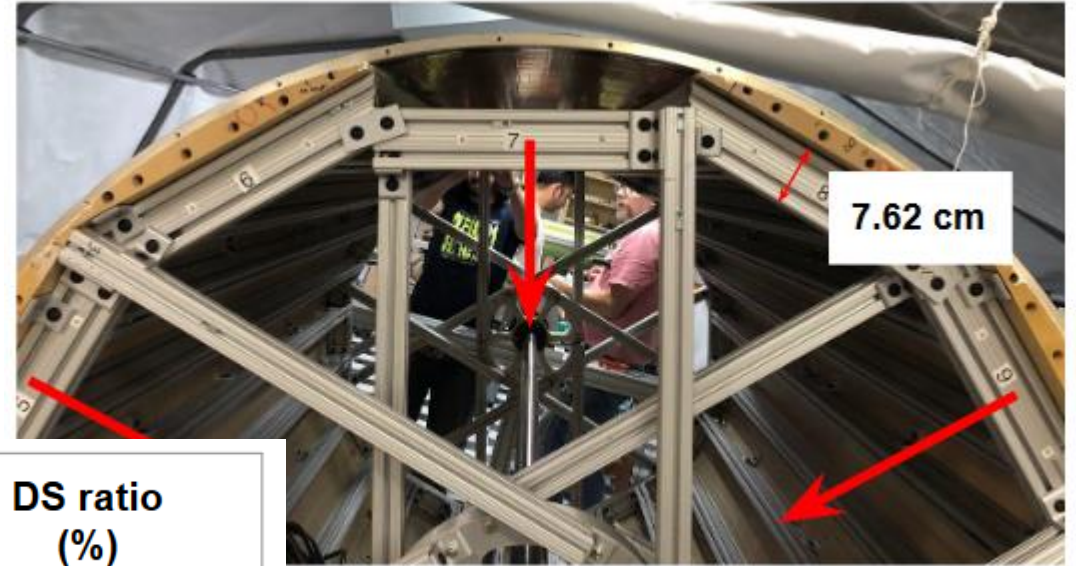
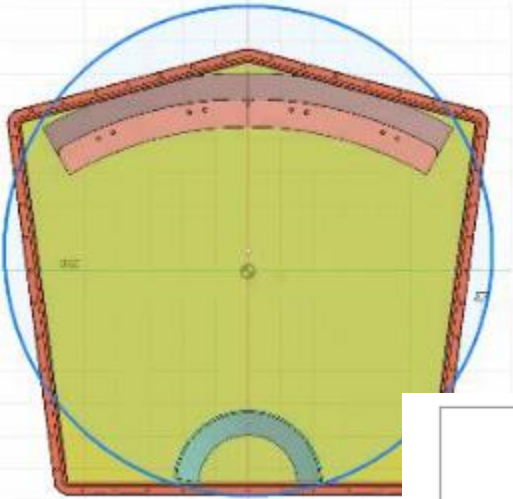
Summary

- Ready to make the shift from concepts to drawings that are producible componentry
- Size and geometry for the mandrel/outer containment vessel
- Start dividing tasks out to begin working in parallel
- Build out a schedule based on the current design and prioritize schedule moving forward, as necessary
- Fall-back plans for any tasks that might slip the schedule critically

Concepts -> Drawings

- There are some outstanding items that need to be confirmed:
 - **Mirror inner and outer diameters** – based on simulation data – for both inner and outer mirrors
 - **Pyramidal mirror geometry** – based on simulation data – to roughly define the shape constraints
 - **Any constraints on tiling scheme** – based on simulation data – such as spacing
- Design Items:
 - Finalize above based on feedback from simulation data
 - Interface descriptions to allow for independent design revisions at component level
 - Component level details

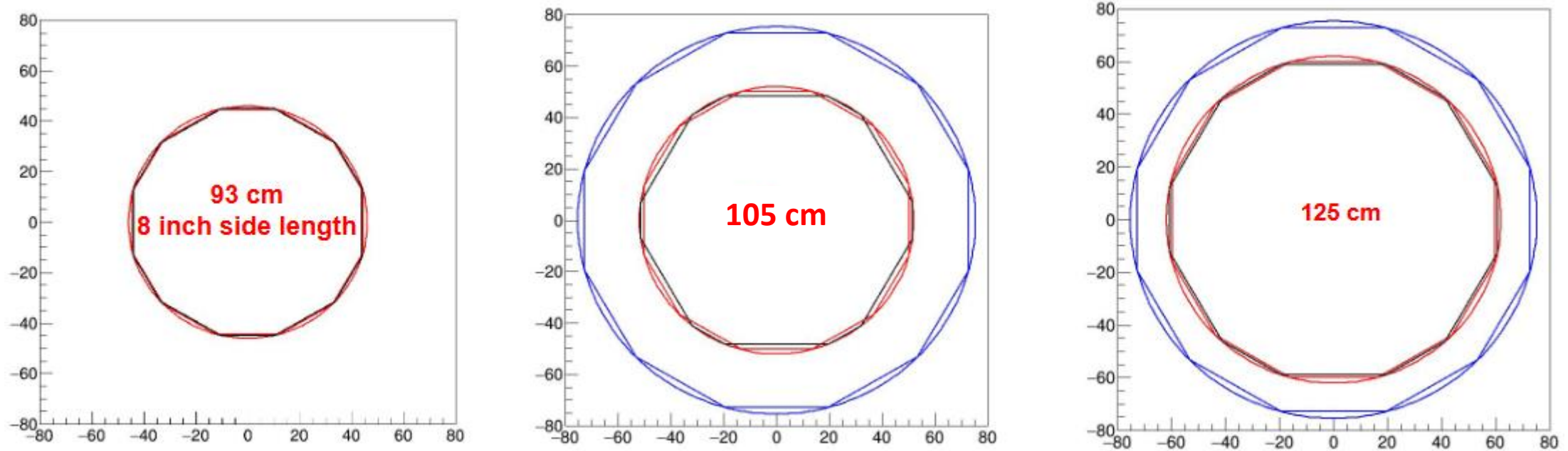
Size and Geometry for Mandrel/Outer Vessel



Diameter (cm)	Diagonal piece length (cm)	DS ratio (%)
78	0.00	0
88	7.38	12.3
98	13.08	21.8
108	17.64	29.4
118	21.42	35.7
125	23.34	38.9

From Bill Li's 9/11 Slides

Size and Geometry for Mandrel/Outer Vessel



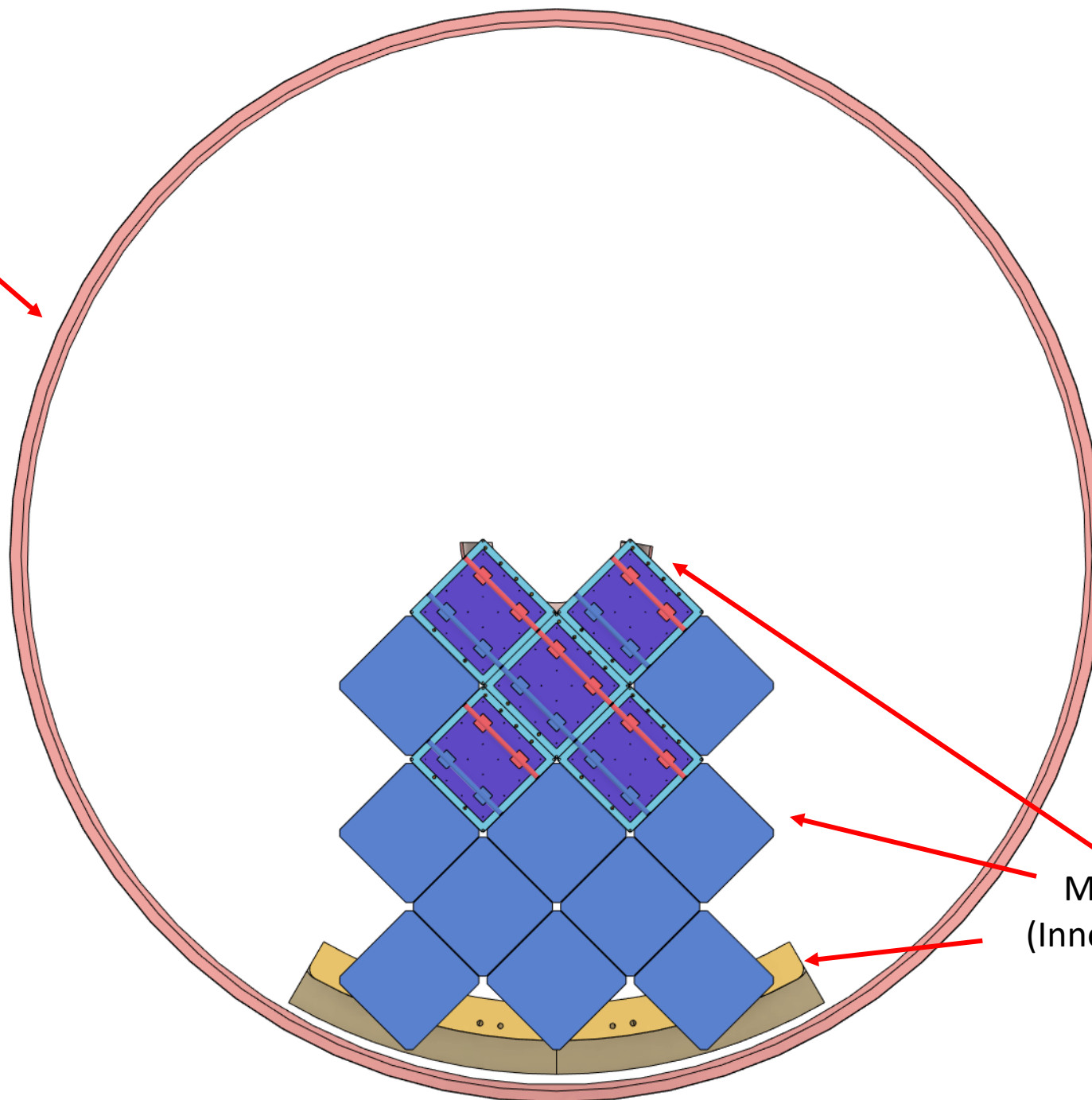
	New hardware	Cost (\$)	Construction time	Adapt for real pdRICH vessel use?
Option 1	Yes	22.7k	June 2024	No
Option 2	No	16.0k	April 2024	Yes
Option 3	No	15.8k	April 2024	Yes

From Bill Li's 9/11 Slides

Size and Geometry for Mandrel/Outer Vessel

- The preference was to produce the smallest possible (simplest, least expensive) cylinder reusing the TPC mandrel.
- The minimum effective size without breaking schedule constraints is 105cm. However, the actual pfRICH size is currently 127.6cm (diameter).
- The option to produce a pfRICH-sized vessel with prototype endcaps seems to be the logical conclusion.
 - Schedule impact: lowest.
 - Cost impact: low, also there should be a cost saving by the time final pfRICH production comes since there will need to be minimal mandrel changes if the size changes
 - Disadvantage: More cumbersome to ship/assemble/etc.

Full Size Containment
(127.6cm)



Minimum Essential Components
(Inner/Outer Mirrors & Sensor Plane)

Task List/Schedule

- Task lists are being defined/developed
- Schedule is being produced (forthcoming)
- Parallel tasks will be distributed soon

Fallback Options

- Some discussion has been had about needing some fallback options in case the schedule slips critically (**for the beam test only**)
 - Using a PVC pipe as either a mandrel or as a standalone outer containment housing
 - Using posts between the front and back plate and wrapping a light tight material around it

Questions?