Post workshop meeting: Feb 23, ’11

Richard Boyce/engineer

Jerry Va’vra

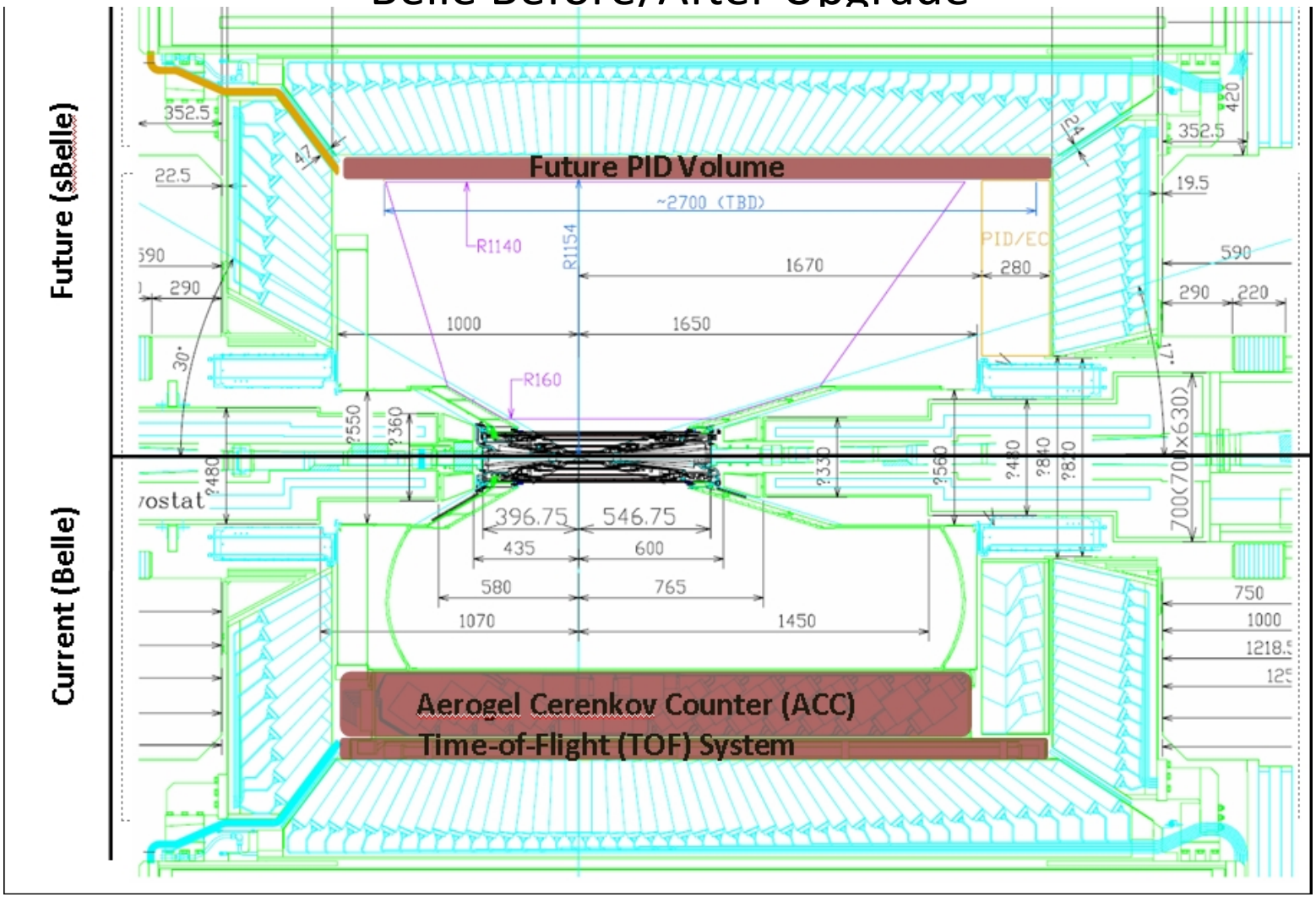
Blair Ratcliff (briefly)

Bill Wisniewski (absent, but sent list of questions through Richard)

Matt McCulloch (Jerry’s tech and glue master)

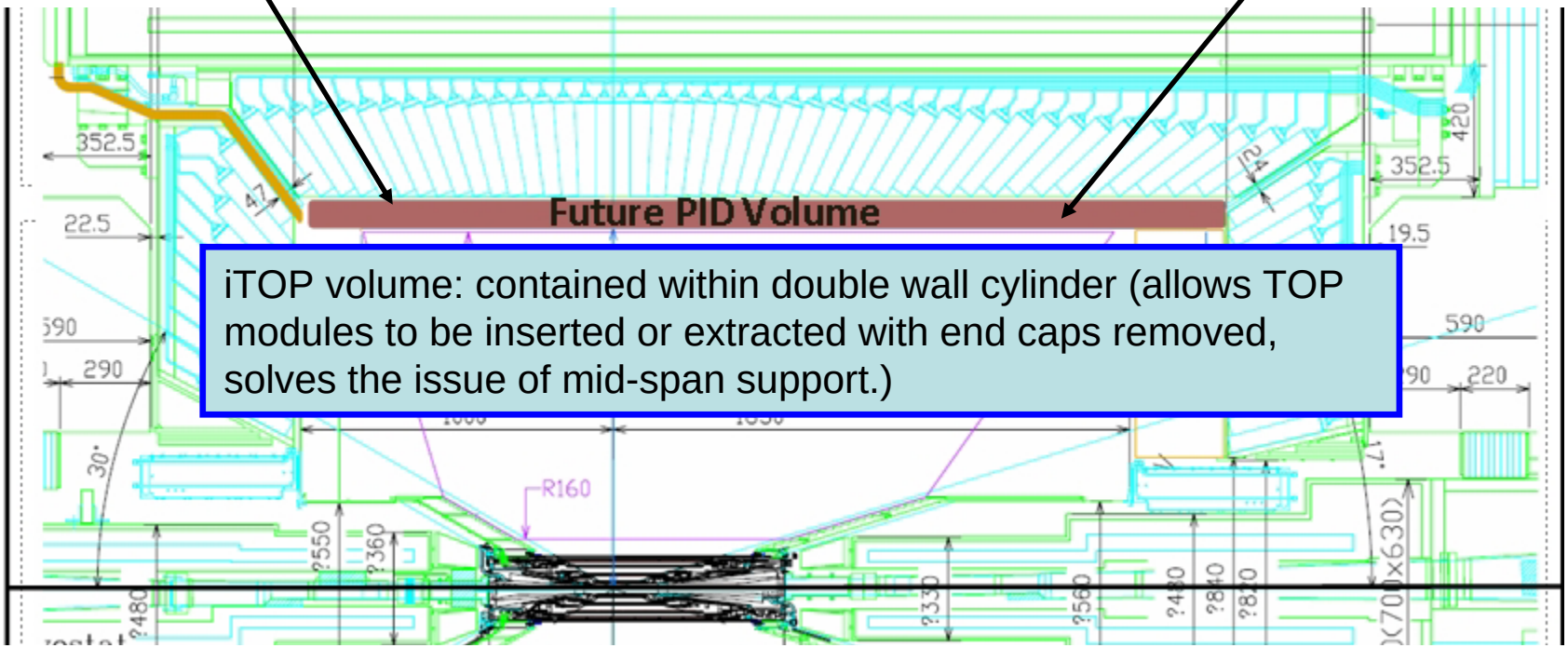
Initial definition of space allocation for bPID

Belle Before/After Upgrade



Suggestion following workshop

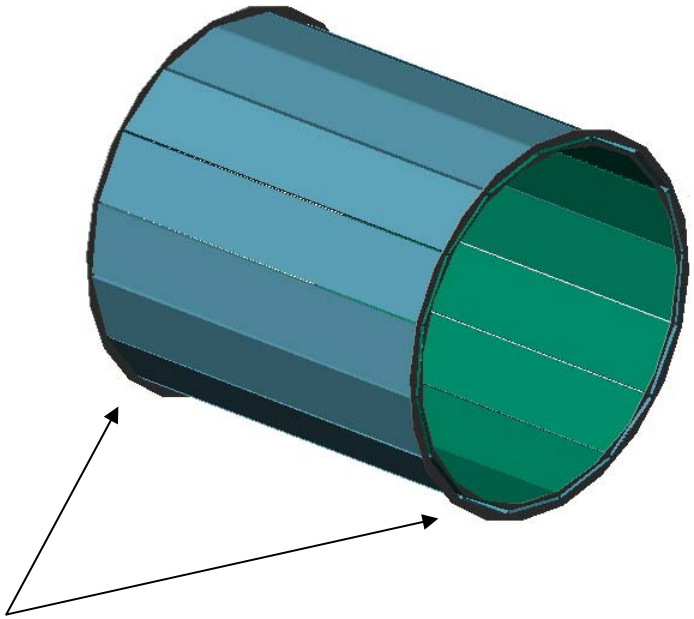
HIGH RESOLUTION SPECTROMETER: light weight and attaches to TOF tabs



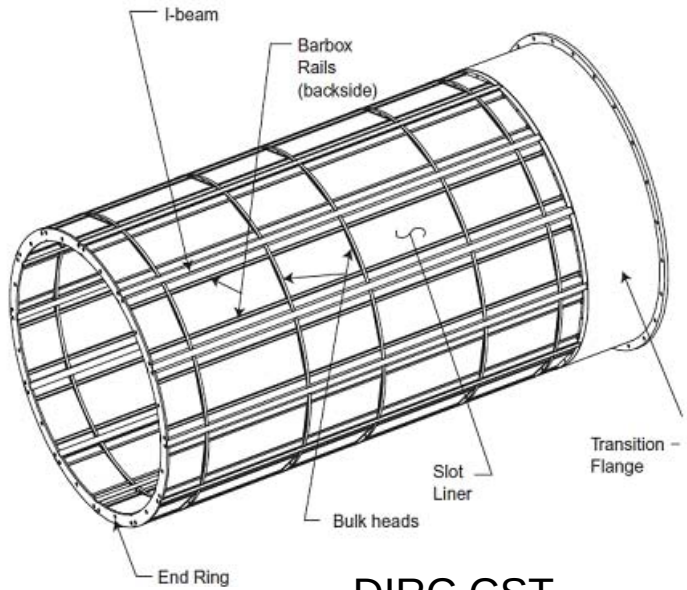
iTOP volume: contained within double wall cylinder (allows TOP modules to be inserted or extracted with end caps removed, solves the issue of mid-span support.)

This plan calls for a significant reduction in the CDC and is also a major change from the TDR.

Early TOP barrel considerations: Copy the DIRC support cylinder



End flanges with slots for bar boxes (very simple)



DIRC CST

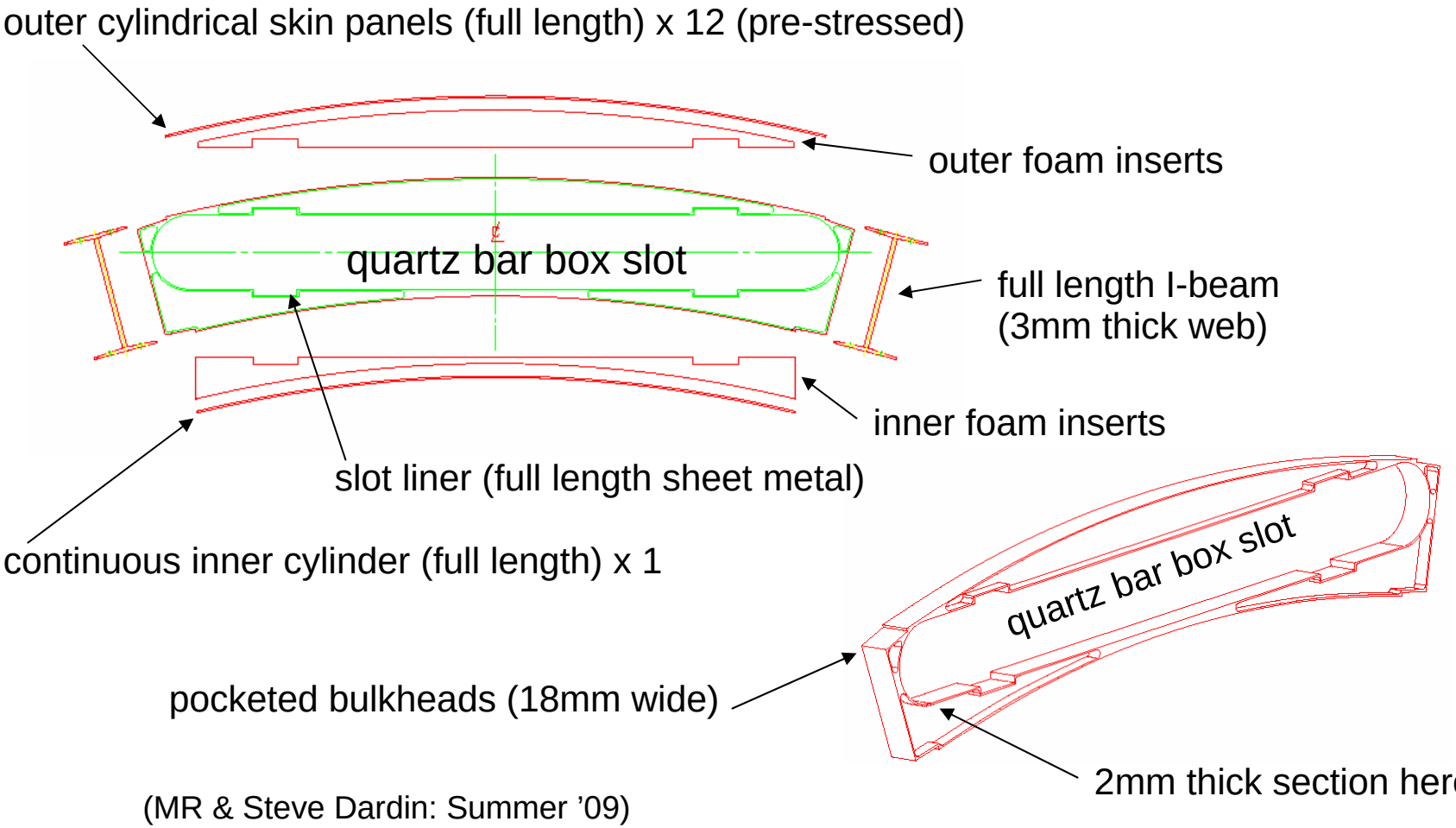
Our final mechanical PID barrel will likely combine aspects both of the above structures.

(MR: Spring ’09)

Early TOP barrel considerations: Copy the DIRC support cylinder

A look at DIRC barrel construction:

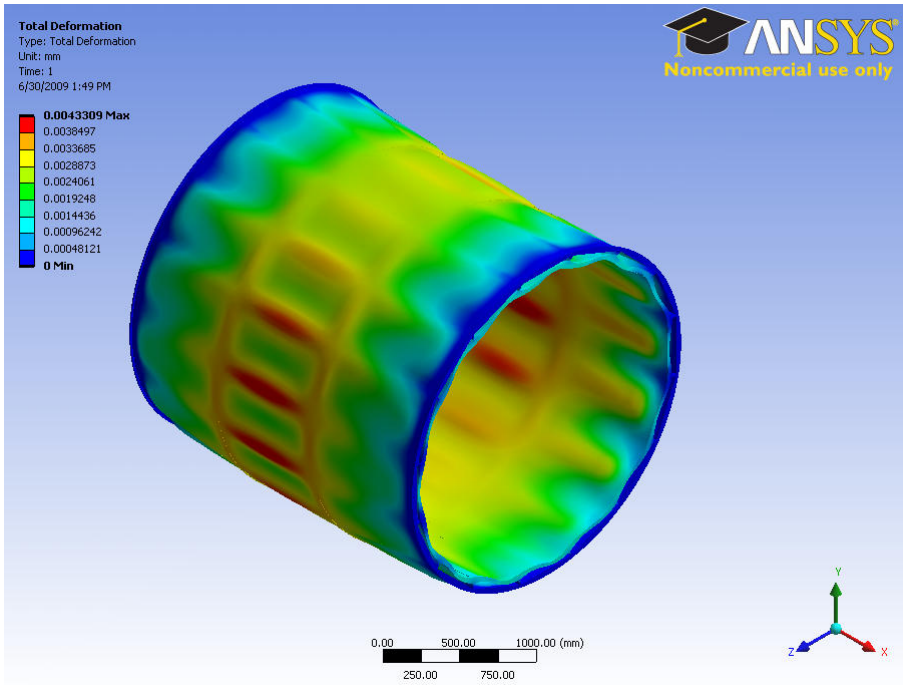
Primary construction method uses bonded epoxy.
Precision jigs + laser alignment are required.



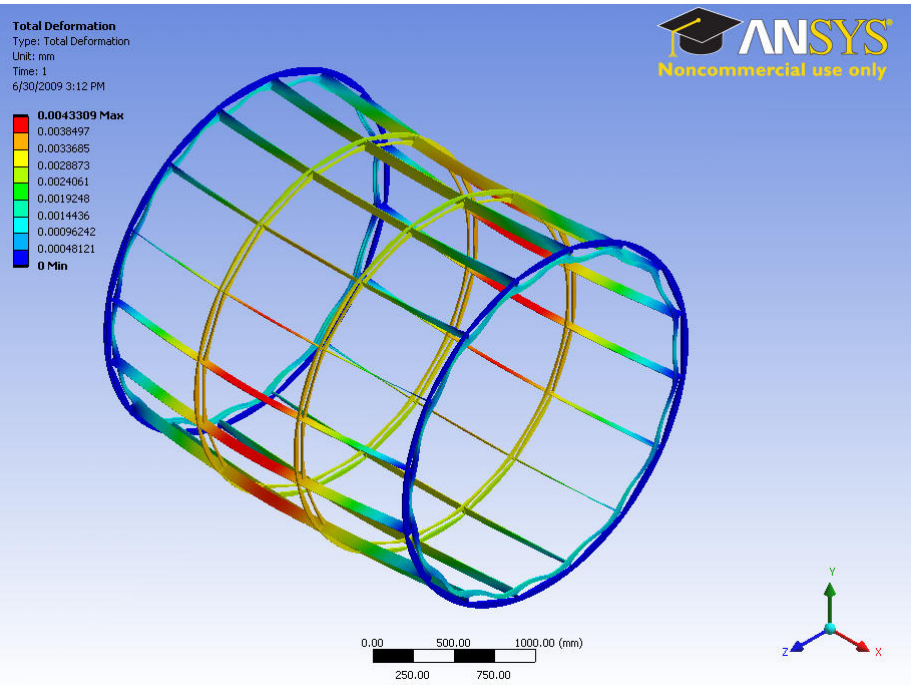
(MR & Steve Dardin: Summer '09)

PID barrel concept for Belle II mechanical model for FEA: double skin cylinder with ribs and circular bulkheads

Double wall skin showing



Double wall skin suppressed

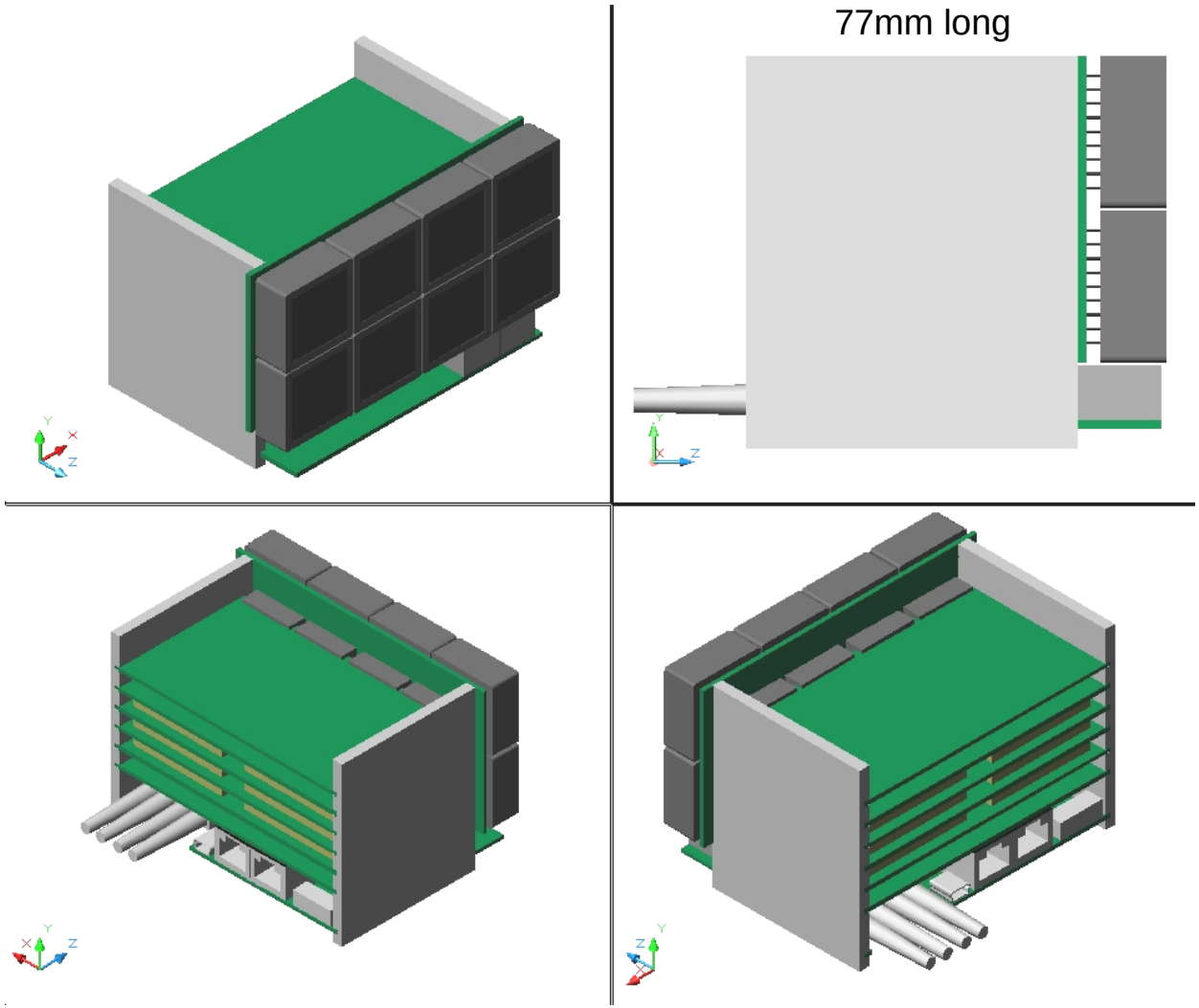


Gravity sag in –Y axis: ~4um!!

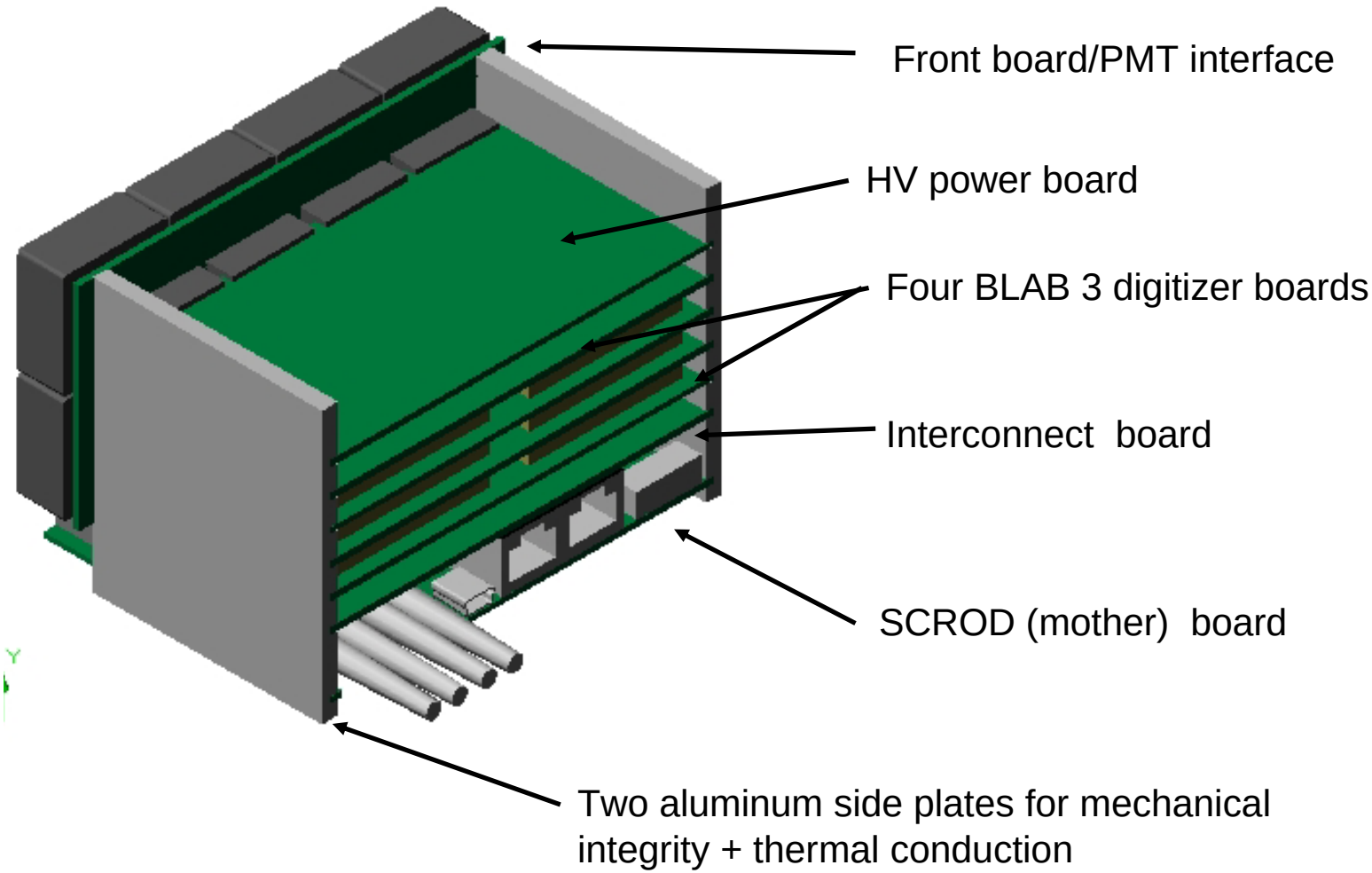
(MR: Summer ’09)

Various views of the default geometry currently under developmenmt

Recently optimized front-end 2x4 module with PMTs

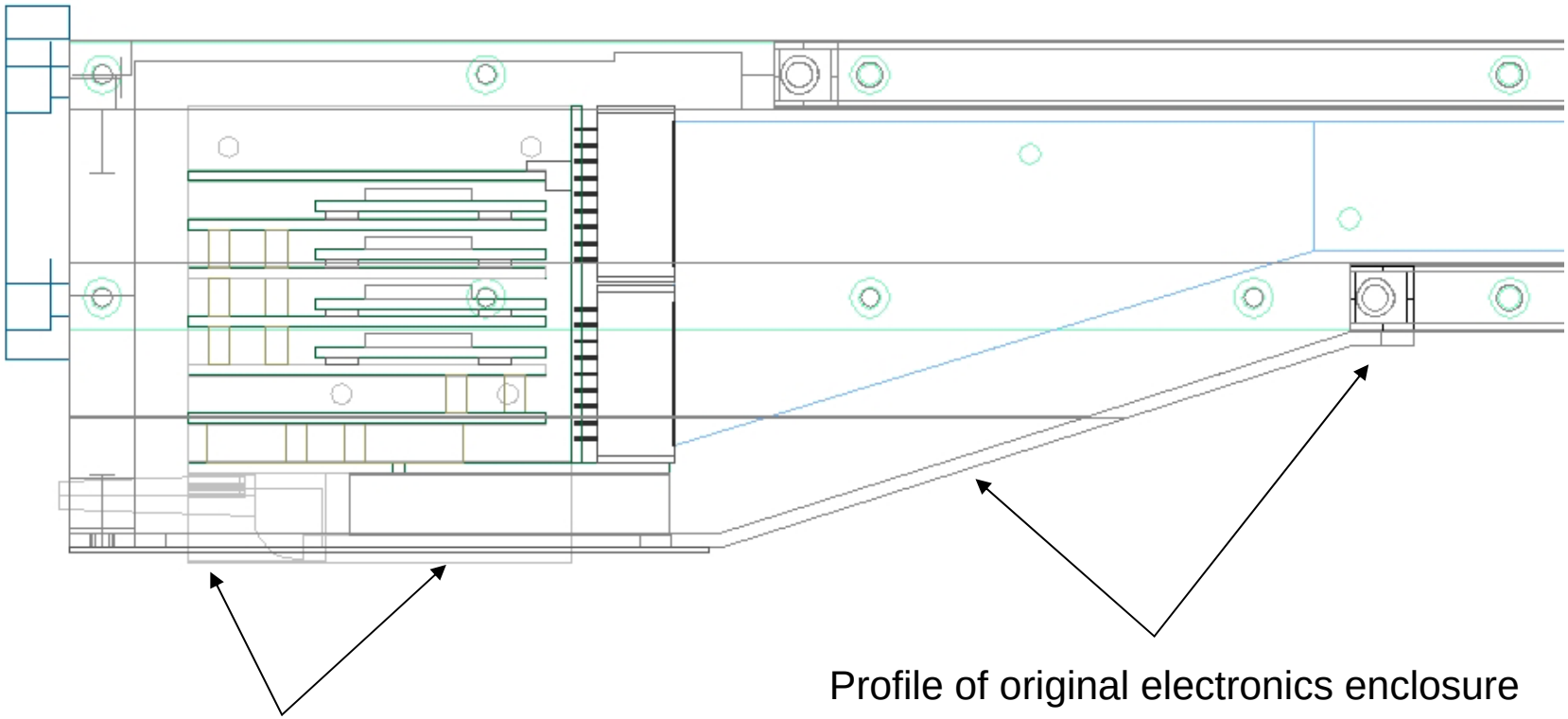


Board stack description of newest FEE module



bPID Electro Mechanical Update:

- Section view of Kohriki-san's QBB + new electronics

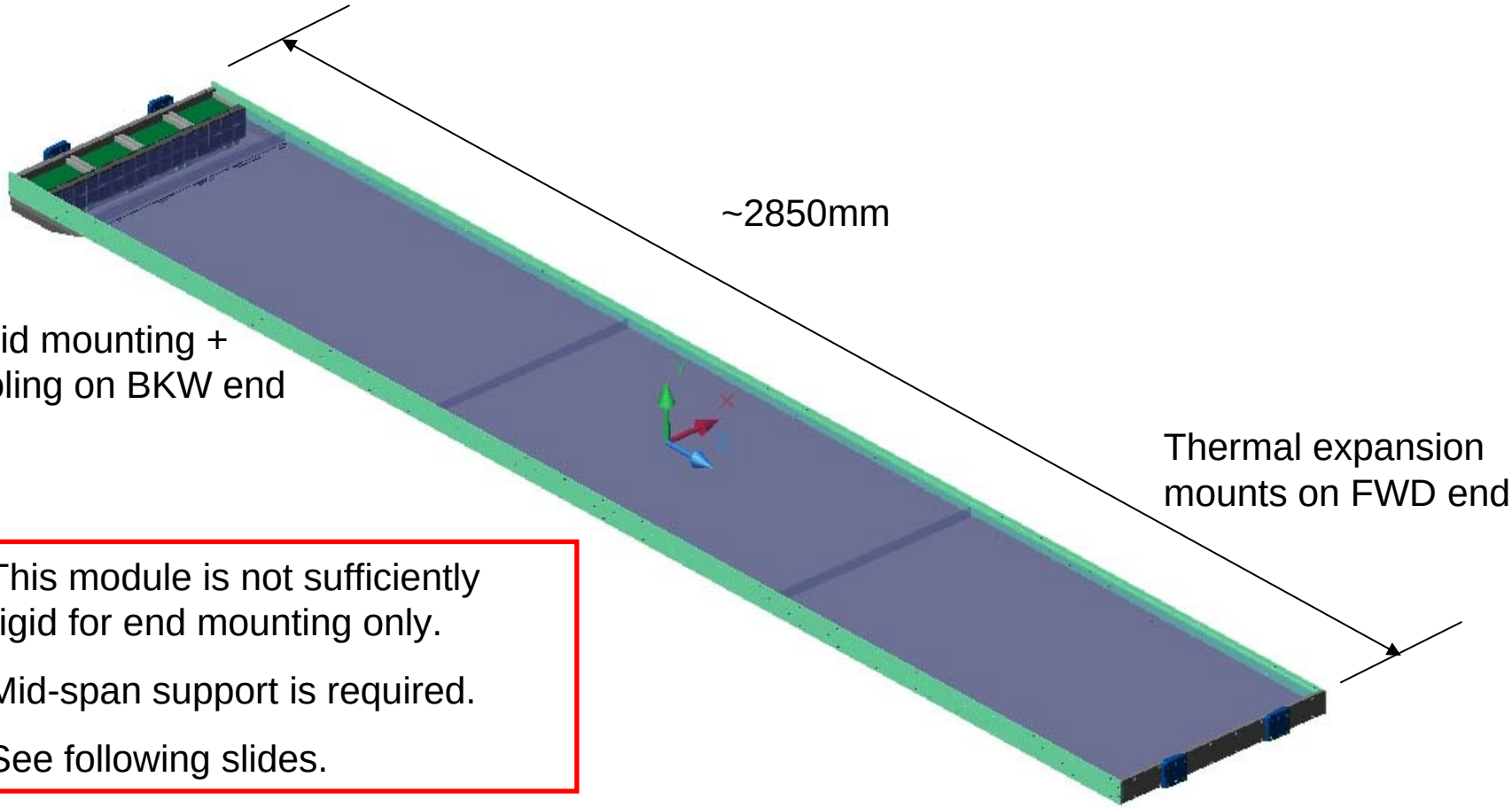


Profile of original electronics enclosure

Outline of new electronics: ~4+mm taller

bPID Electro Mechanical Update:

- Complete counter module (without top panels)



This module is not sufficiently rigid for end mounting only.

Mid-span support is required.

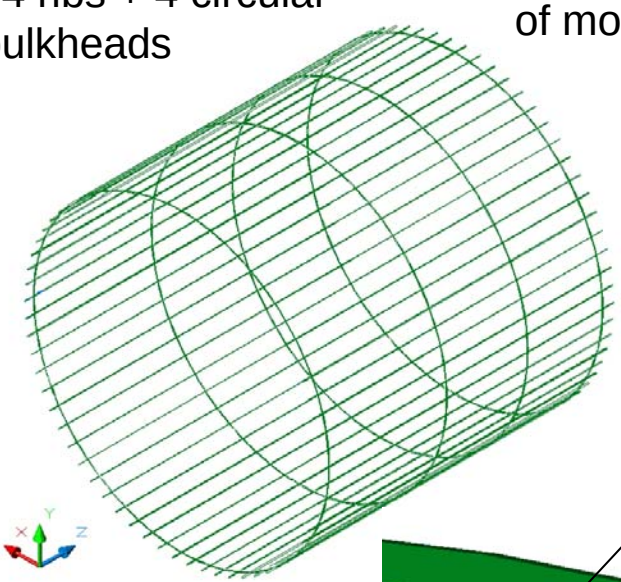
See following slides.

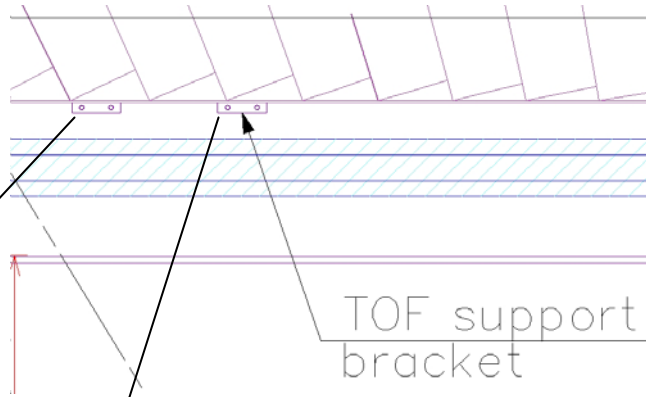
How to distribute the bPID mass in a uniform manner to the ECL cylinder?

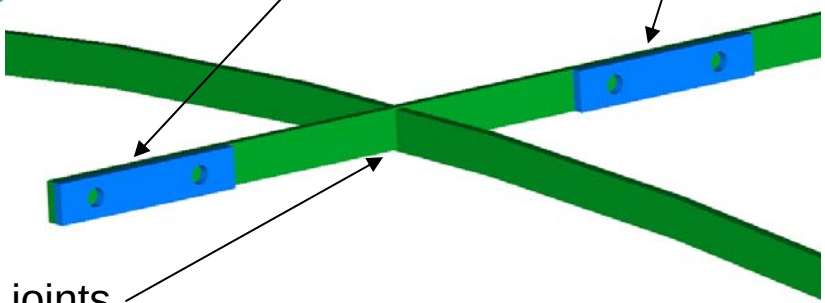
Suggestion: design a radial frame with ribs + radial bulkheads that ties all 256 pairs TOF support tabs together, which the bPID then attaches to.

64 ribs + 4 circular bulkheads

Requires assembly of modular sections





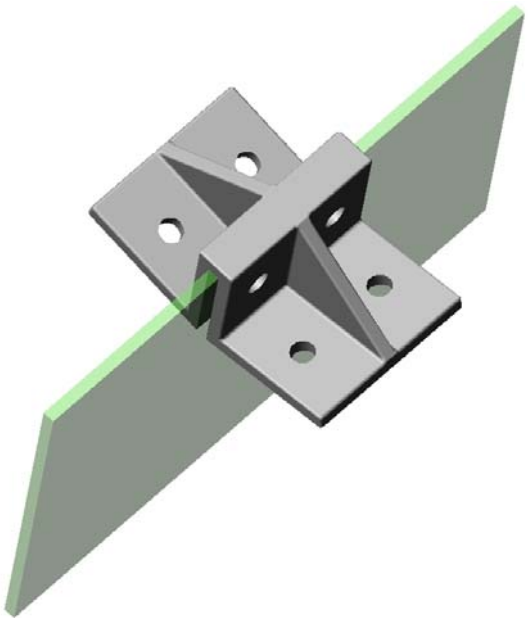


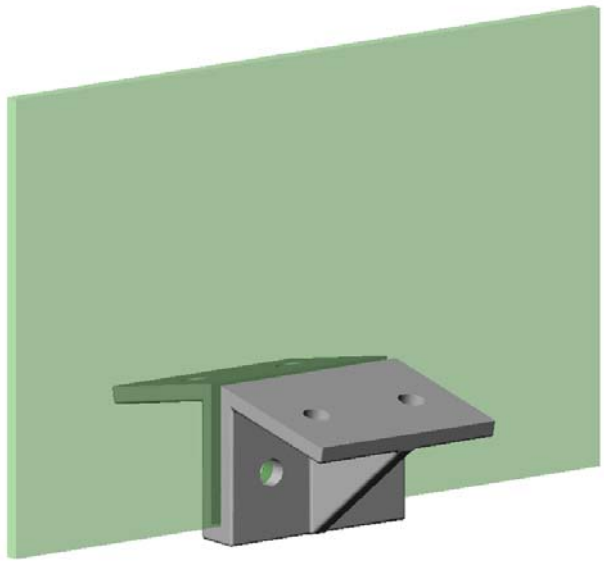
~7.5mm high x 2mm thick
Material: FRP or aluminum

Either lay-up or welded joints

How to distribute the bPID mass in a uniform manner to the ECL cylinder?

Other concepts:



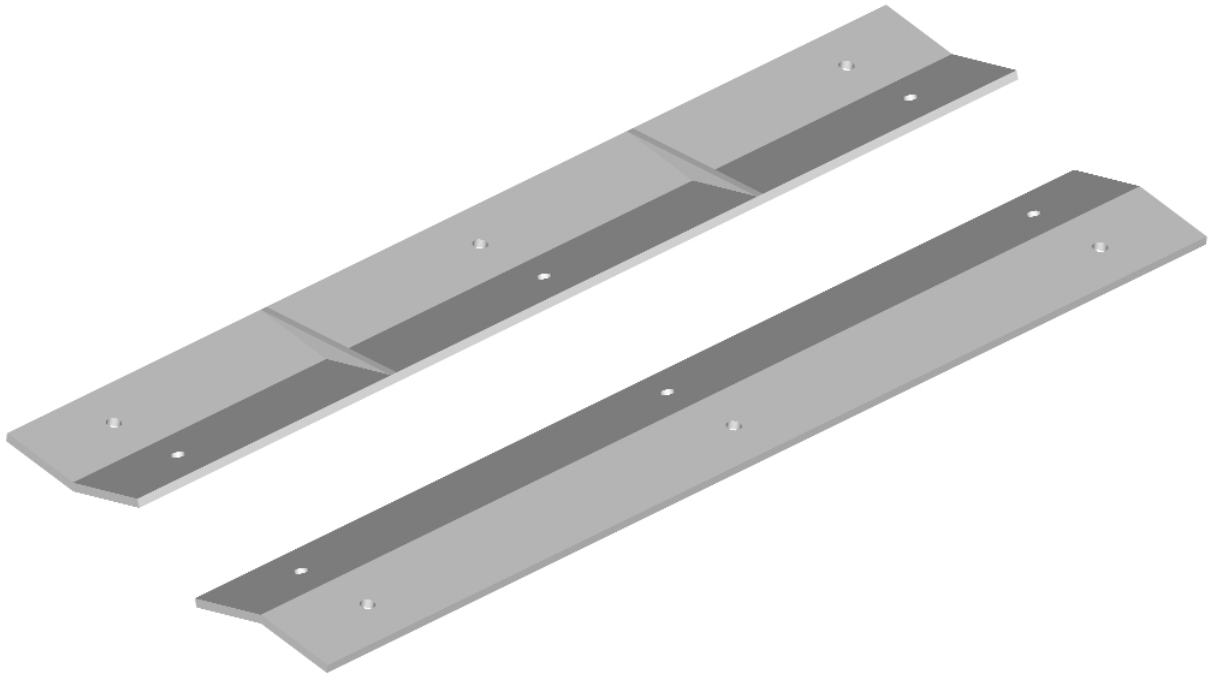


Aluminum tabs fasten to FRP or aluminum ribs that run the length of the ECL cylinder.

This would use only 25% of the available support tabs.

How to distribute the bPID mass in a uniform manner to the ECL cylinder?

Other concepts:



Aluminum brackets that fasten to the inner surface of each QBB to form a Roman Arch.

Summary and Action Items: (from workshop)

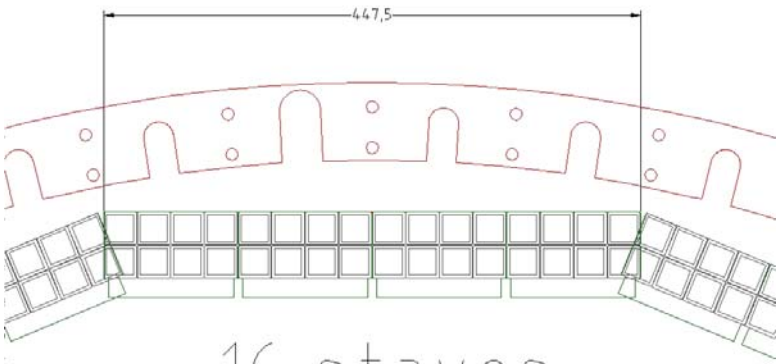
- Finalize and test electronics design, including optical coupling.
- Develop cooling design for electronics.
- Finalize mid-span support for QBBs.
- Finalize model for electronics extraction/replacement.
- Finalize integration schedule.
- Develop integration plan: iTOP modules will have to be integrated individually with a strong back support fixture.
- A bPID stand alone support cylinder is not acceptable for this sub-detector integration.

Summary and Action Items: (for today)

- Finalize and test electronics design, including optical coupling.
- Develop cooling design for electronics.
- Finalize mid-span support for QBBs???
- Finalize model for electronics extraction/replacement???
- Finalize integration schedule.
- Develop integration plan: iTOP modules will have to be integrated individually with a strong back support fixture???
- Reconsider the use of a stand alone support cylinder as an acceptable approach for this sub-detector integration.

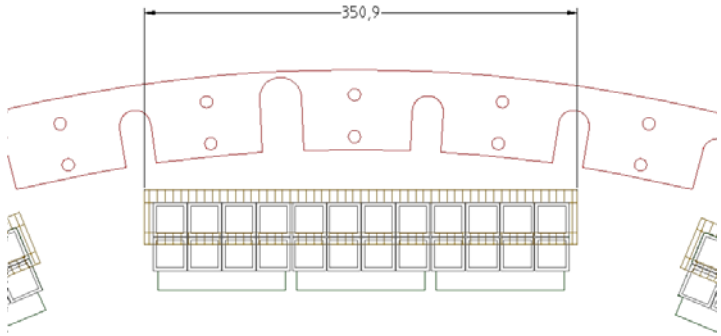
New R-phi geometries to consider???

Two row SL-10 arrays: 2 x 4 x 4 = 32 tubes per module
(32 SL-10 MCPs per counter x 16 counters = 512 tubes)



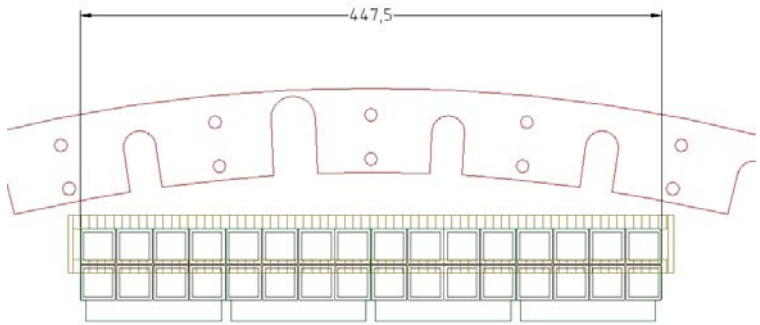
16 staves

Two row SL-10 array: 2 x 4 modules x 3 modules per counnter
(24 SL-10 MCPs per counter x 16 counters = 384 tubes)



16 staves

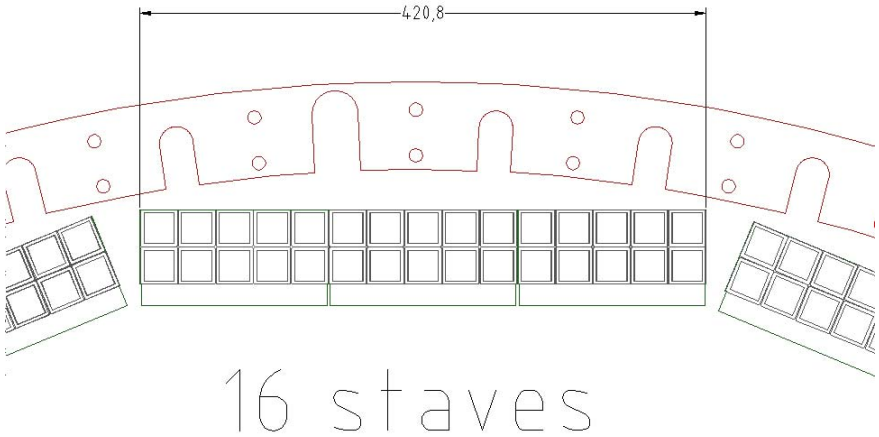
SL-10 array 2 x 4 x 12
(32SL-10 MCPs/counter x 12 Counters)



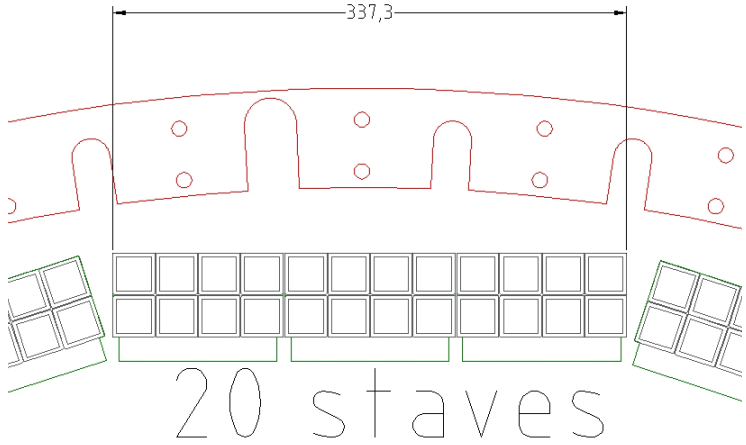
12 staves

New R-phi geometries to consider???

SL-10 array: 2 x 5 per module x 3 modules
(30 SL-10s per counter x 16 counters = 480 tubes)



Two row SL-10 array: 2 x 4 modules x 3 modules per counnter
(24 SL-10 MCPs per counter x 20 counters = 480 tubes)



Two row SL-10 array: 2 x 4 modules x 3 modules per counnter
(24 SL-10 MCPs per counter x 18 counters = 432 tubes)