Update on beamline components

PMQs, EMQuads, Collimator, Supports, Beam Monitors, Cabling, and Target Ladder

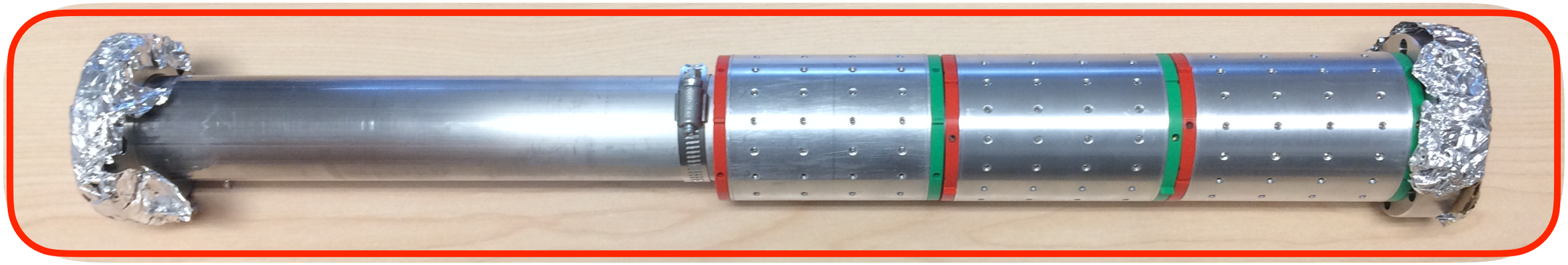
Kate Pachal

Reminder of issue tracking

- Currently tracking integration/installation items in two places, each handling different type of task
  - Doug's list: covers experiment components at high level and allocates responsibility to institutions. TODO this week: update statuses
  - Stephi/Kate/Laura list: low-level, largely focused on installation and integration tasks; allocates responsibility to individuals. Updated last week; new sheet "To do list" has most current details
  - Possibly useful to merge them? Not sure. Opinions welcome
- Both linked from homepage of main wiki: https://github.com/DarkLight-EXP/wiki/wiki
- Will show tracking in these slides where relevant. Despite how things look, we have actually done lots of stuff! But this talk is focusing (for obvious reasons) on things that are still outstanding …

PMQs

- Reminder: two sets of 3 PMQs with different strengths
- “Commissioning” PMQs are the first 3 we bought; all 0.3 T.
    - Obtained a while ago and mounted on spool piece by UBC shop.

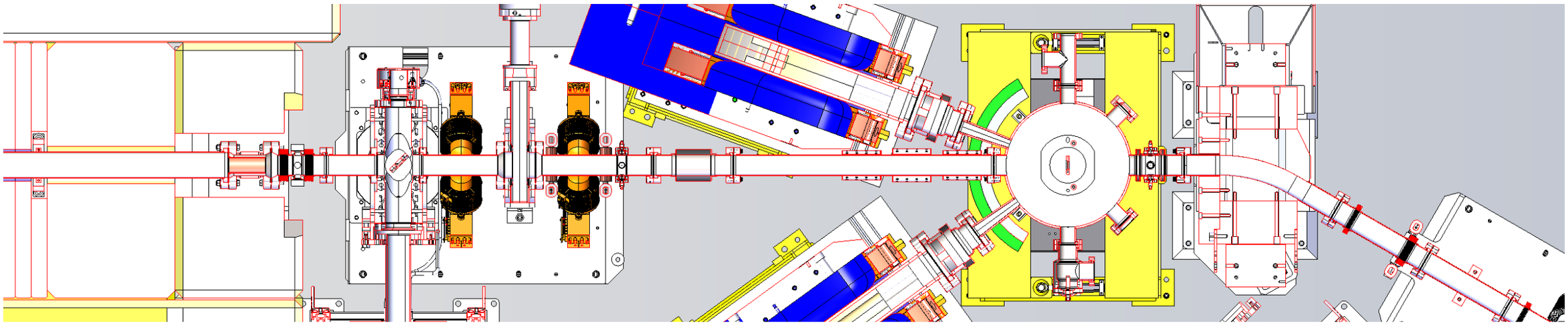


    - Now waiting for alignment by beamlines team (Shaquille) - in the queue behind finishing spectrometer mapping

- “Physics” PMQs are the new triplet: 2 x 0.55 T and 1 x 0.9 T. Order to Sabr finalised and paid Nov 12. No recent updates on status but it didn’t take too long last time. Will ship directly to TRIUMF. Suggest Mike check on them ~ late February if we haven’t heard anything yet.

EMQs

Optics design uses 2 EMQs. There are currently 2 EMQs in the beamline section to be replaced, but they aren't the same type/size so need to swap for 2 others.



In the tracker:

EMQs				
	Locate correct EMQs	Stephanie		not started
	Get power supplies for EMQs from Arthur	Stephanie		not started
	Do we have appropriate cables? Use existing ones?	???		not started

Collimator

BOTTLENECK ALERT

- Design is final and ECO'd. Water connection concept exists: going to connect to low-conductivity copper active water system. Thus copper portion of design is good, and gives better heat transfer.
- Challenges:
  - Getting it made!! Our shop is too full and as of last week absolutely cannot do it. UBC shop and all other contacts in the Vancouver area do not have technical capability for this difficult weld. Currently looking for somewhere else to send it, likely out of province.
  - Required to provide proper thermal analysis. Laura is on this task. Can come in parallel to manufacture
- IF THIS IS NOT READY WE DO NOT INSTALL

Did not add another drop-down option for "trying so hard" 😢

Collimator					
	Thermal analysis	Laura		not started	
	Fabrication	Kate, Thomas		not started	Cannot be done in TRIUMF shop. Needs to be outsourced.
	Plan for electrical connections/readout and water	Stephanie		not started	
	Write interlock specification document for controls	Stephanie		not started	
	Integration into machine protection system	Stephanie		not started	

Supports (stands?)

- Not absolutely sure what this is referring to, but I am guessing the stands for the shielding
- MIT handling design, TRIUMF handling construction
    - As discussed in recent integration meeting, TRIUMF prefers a design that does not use welds on the joints, if there are reasonable alternatives. If we need to do any welding we have to go to UBC
    - Doug P thinks these can be done pretty straightforwardly but if we run into person power bottlenecks within his group we can also try SciTech. Philip is usually quite flexible
    - Laura will follow up once design available to make sure it gets done somewhere.

Stands					
	Stands for shielding: manufacture	Laura		dependency	Waiting on receiving final design from MIT

Beam monitors

Controls				
	Get buttons & electronics to hook up new BPM(s)	Stephanie		not started
	New BPM, any relocated diagnostics, etc into EPICS	Stephanie		not started

- Getting new buttons and cables: should be easy, the BPMs are standard and we ought to have lots of those around

- Getting them into EPICS: hard. Controls is going to be another bottleneck for us as the group is really really overstretched right now

- Looking for ways to help:

  - Train undergrad, if we get lots of co-op students? (We might)

  - Trade anything else?

Cabling

- Cable management tab added to spreadsheet: link

Device	Sourcing	Cable itself	Connectors	Number	Responsible	Delegate	Status	Relevant work request
Spectrometer power supplies	Custom	250 A rated, 35	"Easy to get"	4	Kate		in progress	
Flow meter & thermal switch	Custom			4	Unassigned		dependency	
Hall probes	Off-the-shelf	75 foot	DB9	2	Laura		done	
Convectron gauge				1?	Doug H		in progress	
Ion gauge				1?	Unassigned		not started	
Ion pump power supply	Custom	20 m or 30 m?	Safeconn	2 with sep	Kate		not started	
Was a mention of another pump power supply Ernie was meant to give info on - what was it? Neg pump? Dimo had expressed some worries about cables for a neg								
Trigger power supplies	Custom			?	Mike		in progress	
GEM low voltage power supplies	Custom				Unassigned		not started	
Ethernet cables to hall				?	Jan		not started	
Good quality HDMI cables for GEM	Off-the-shelf				Michael		not started	

- **Hopefully** not a bottleneck, but some concern with whatever needs to be made on site
- Will we run into trouble with Mel on any of these?
- MIT: are we missing anything? (Please cc everyone relevant, e.g. Stephi, Jan, Doug P, Doug H when sending info)

Target ladder

- Tasks to do: swap targets in ladder, update controls

- Targets: can only be done during installation step as getting ladder out of current location requires breaking vacuum. TRIUMF group should get it out, replace target, put it in new location.

    - Targets are on shelf in Kate's office, unopened package from Doug. TBD: confirm that we have what we need in there. Kate will do in next 2 days and give targets to Mike

- Controls: could be done anytime, and discussed with controls group more than 1 year ago. But has never become urgent so has not been done.

    - Stephi is managing this task and will follow up with controls

- Need to add fiducial to scintillating screen or ladder near it in order to have a way of measuring beam spot size!

Shielding

- Need to shape experiment shielding
- Part around GEMs: easy, it's square. But waiting on removing existing shielding from beamline, which is waiting on CNSC approval of new layout
- Part around chamber:
  - Borated poly: we have some chunks set aside we could use but they need to be sliced
  - Lead: discussed using shot
- All on Doug P's plate at present - feel free to delegate!

Shielding				
	Remove existing shielding from beamline	Doug P		dependency
	Shape lead for adding around experiment	Doug P		dependency
	Shape borated poly for adding around experiment	Doug P		not started
	Put some chevron bricks downstream around sensitive e	Stephanie		dependency

Discussion