Cameron Clarke

MOLLER Parametrized Detector

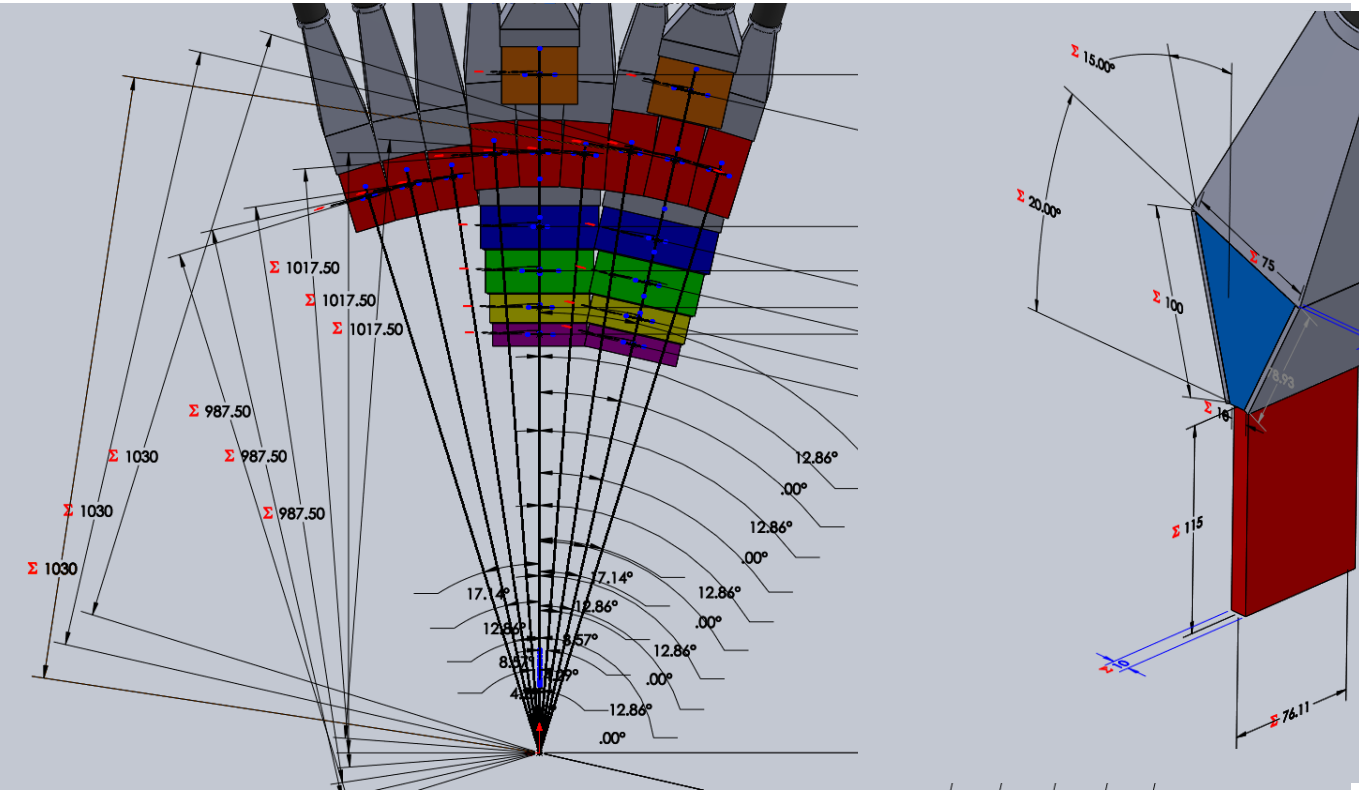
Update 2-23-2018

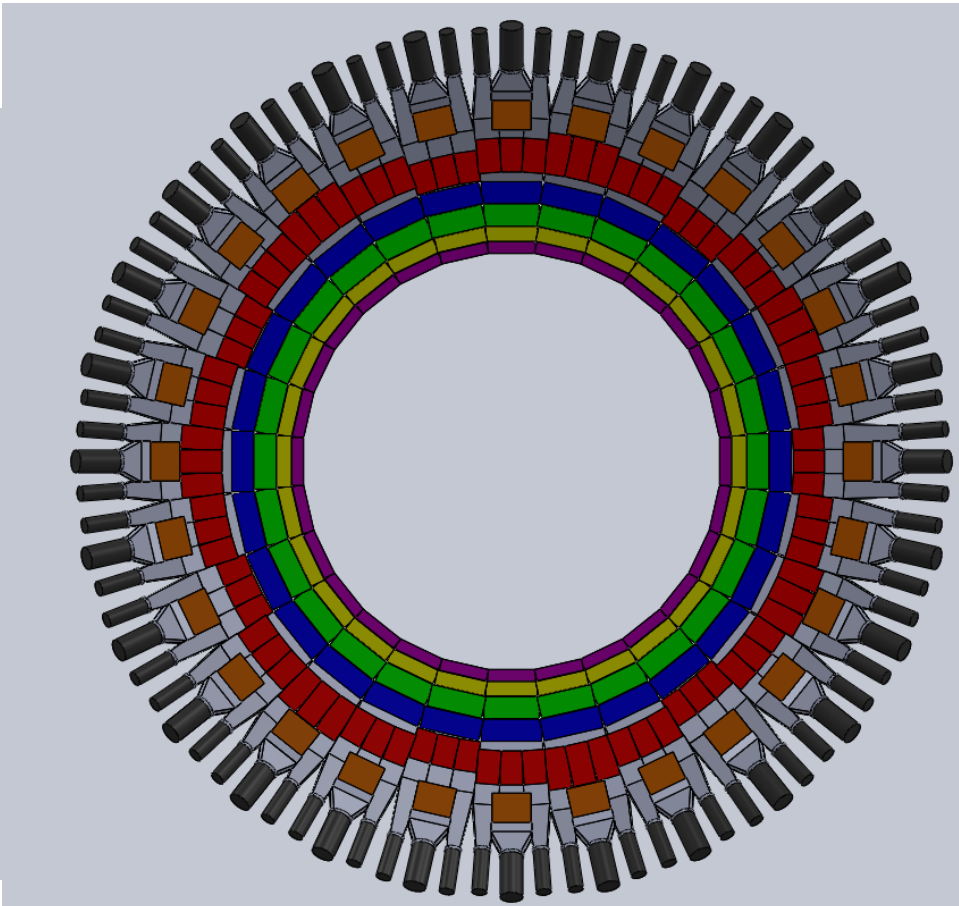
MOLLER Detector Meeting

Parametrized Detector Array Progress:

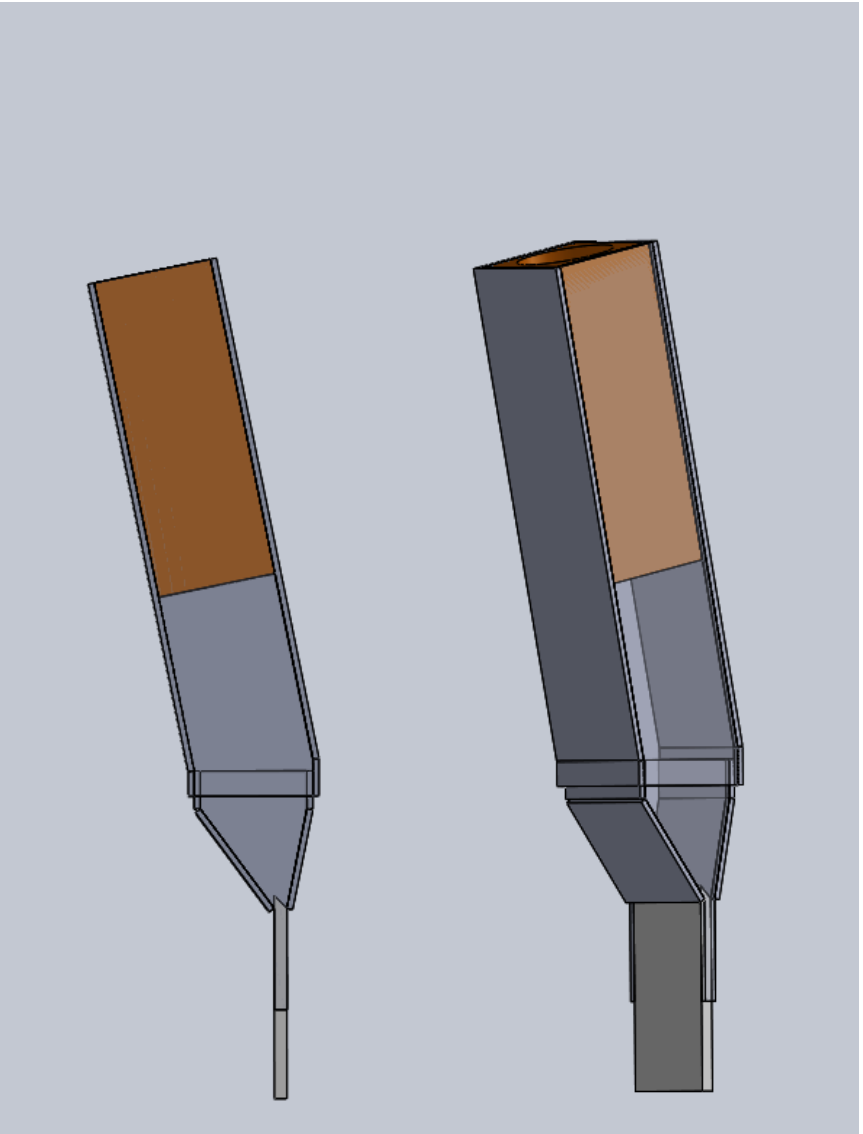
- CAD Design – matching Mainz test prototype geometries
- Geant4 GDML – updating the perl-script writer to include gdml materials
- Master parameter list – updating to fix discrepancies
- Version control – adding to git submoduling, main geometry, and CAD

What we have to play with in CAD/GDML:





Mainz beamtest prototype geometries:

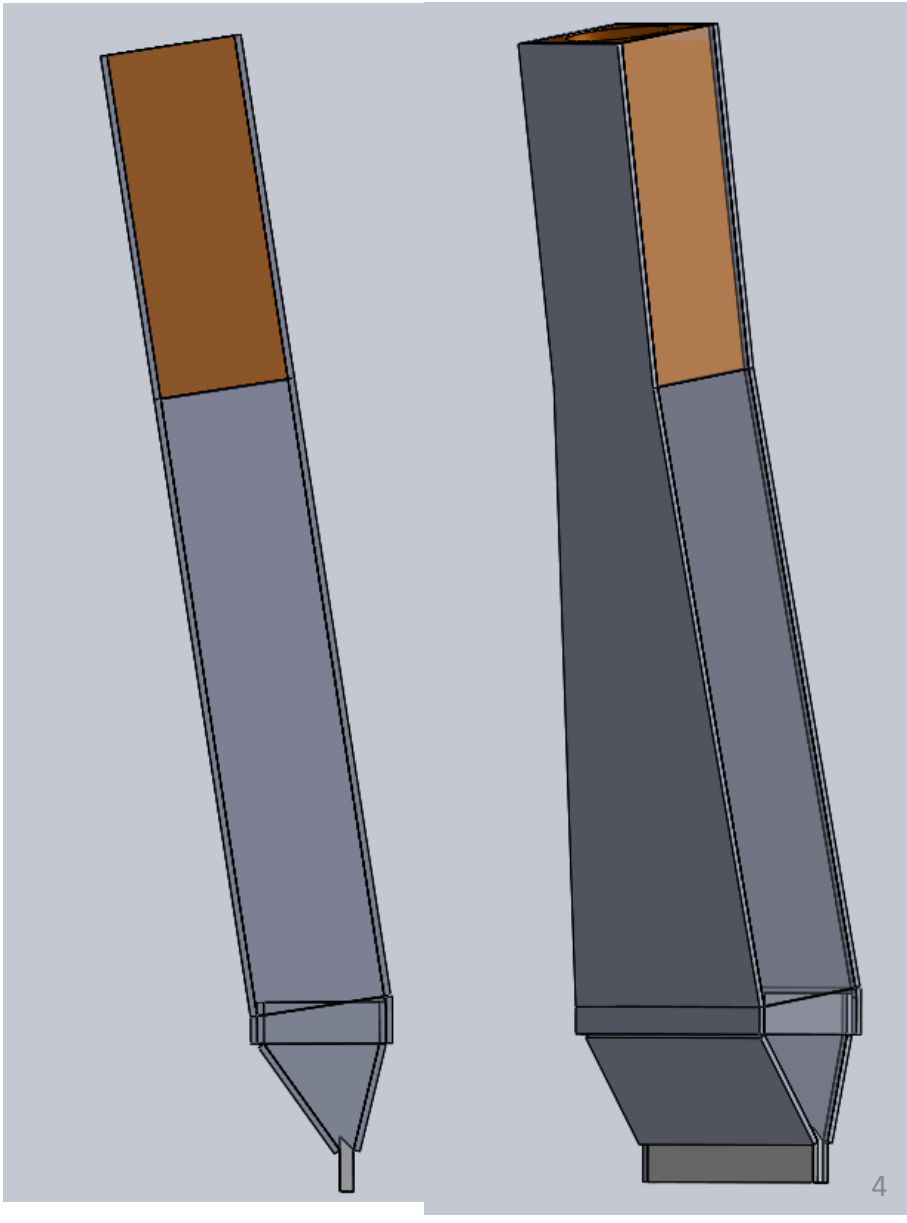


1cm thick single

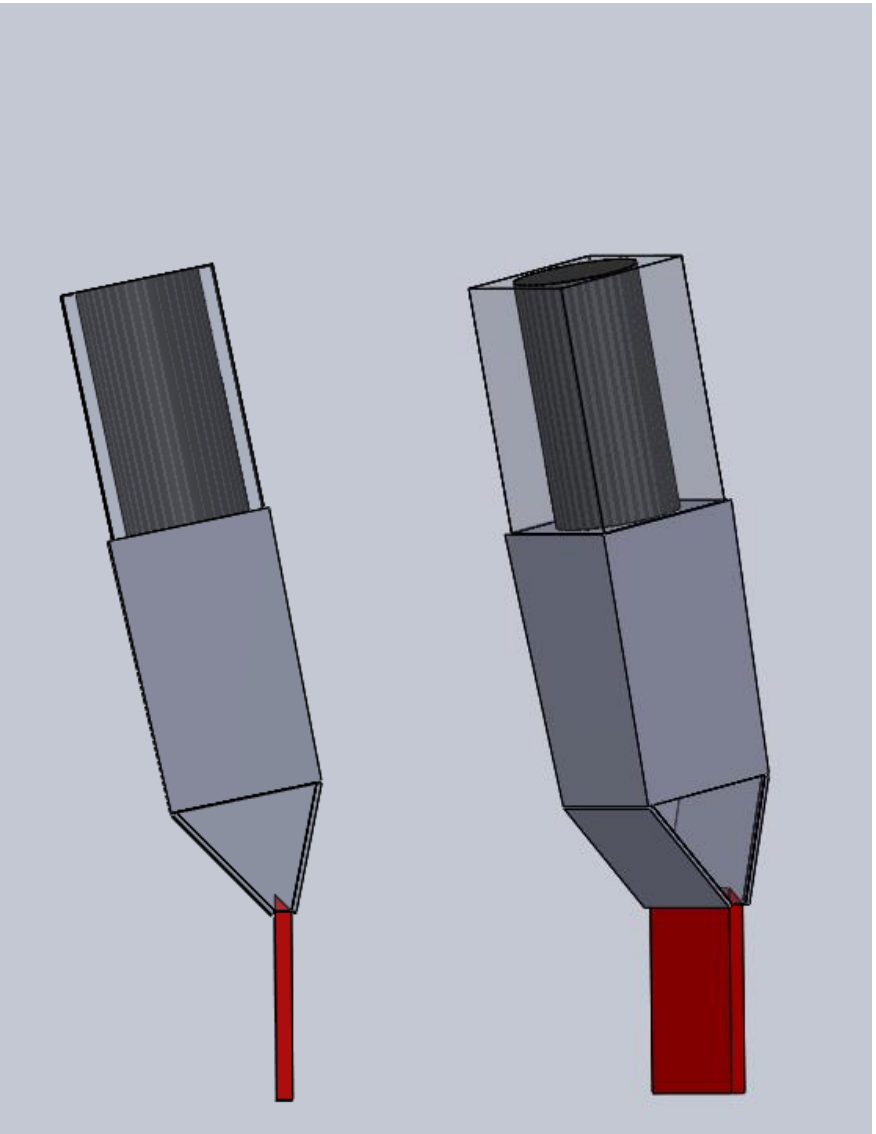
Cut quartz tile design

Superelastic Ring 1 →

← Moller Ring 5



Parametrized detector matching attempt:



1cm thick single

Cut quartz tile design

Superelastic Ring 1 →

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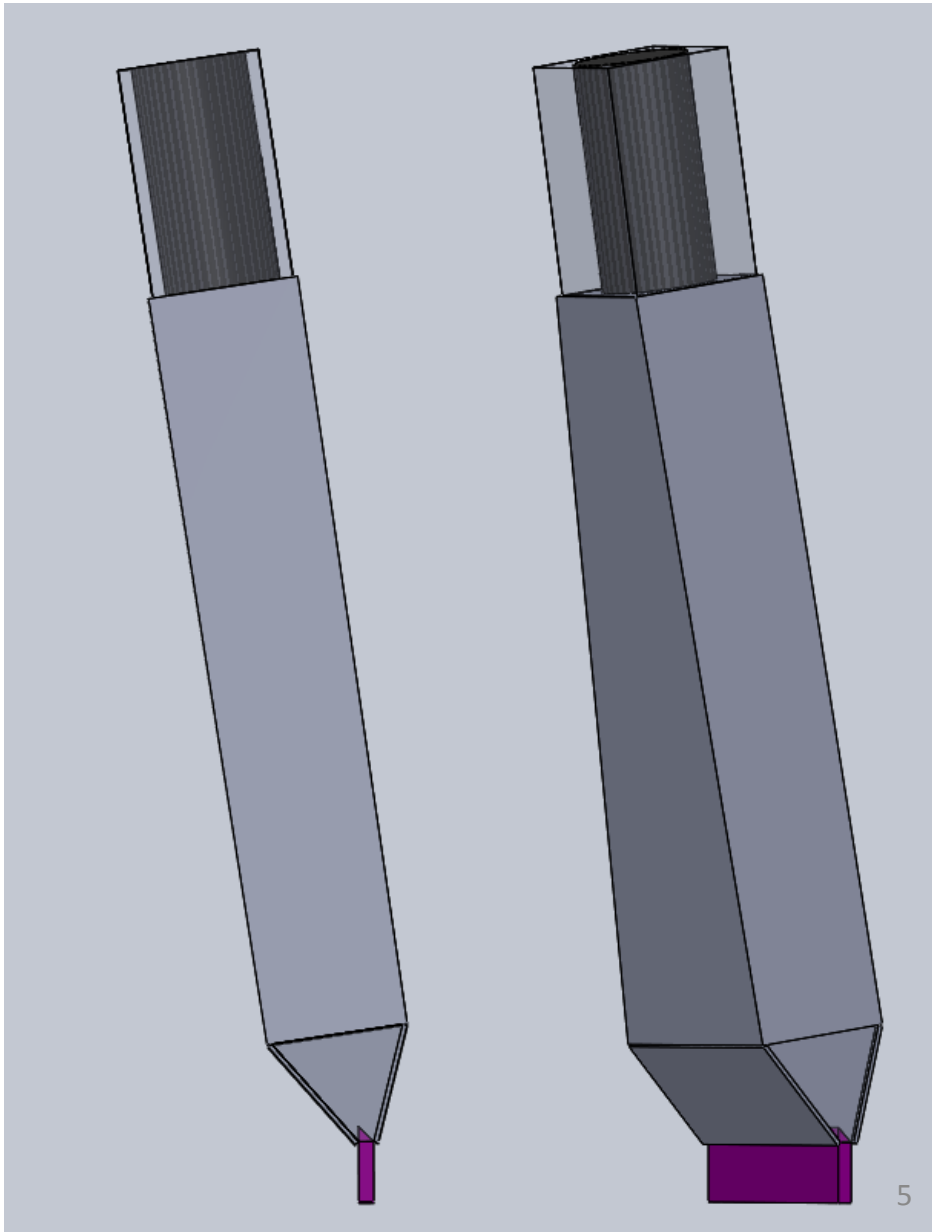
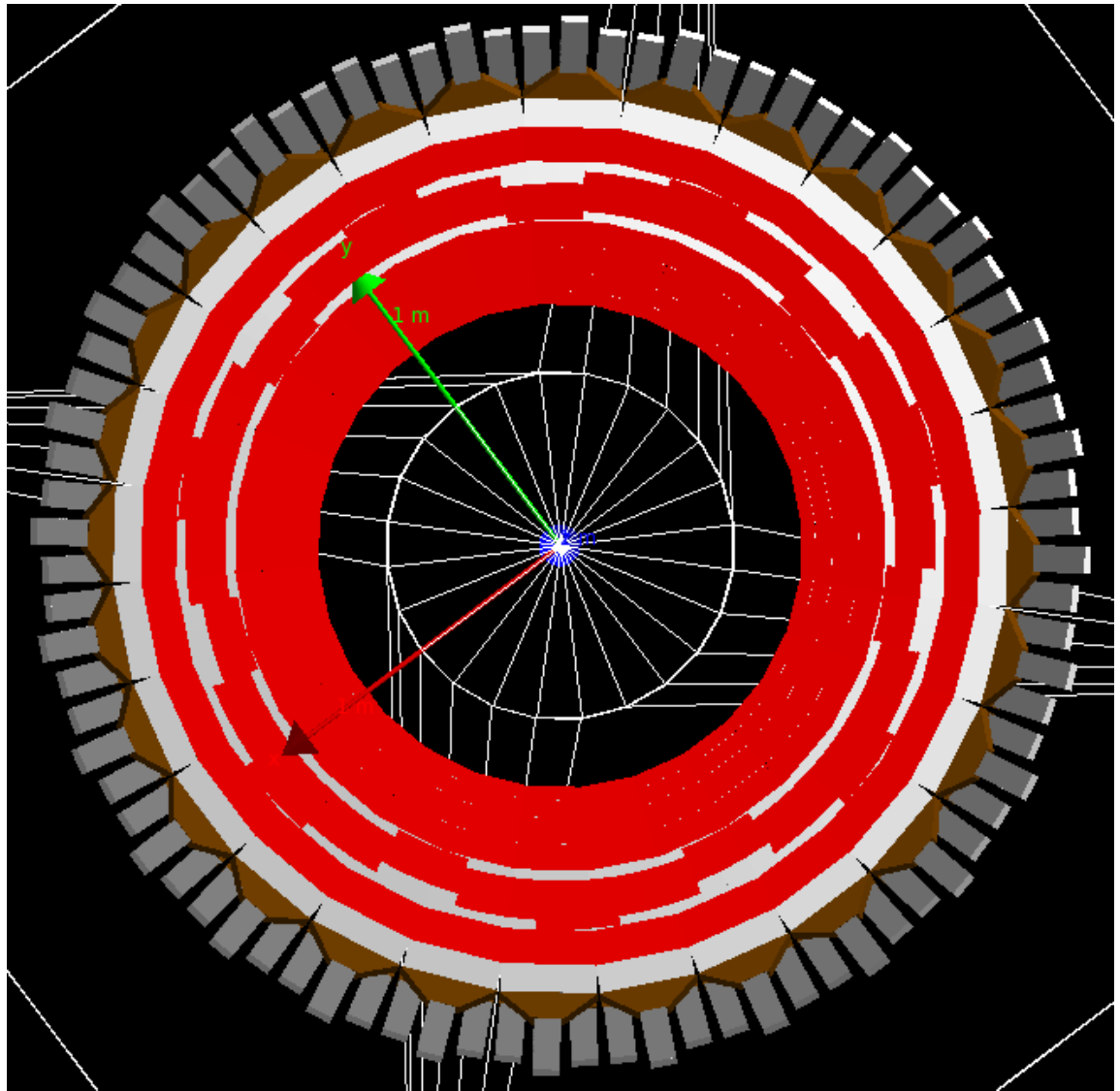
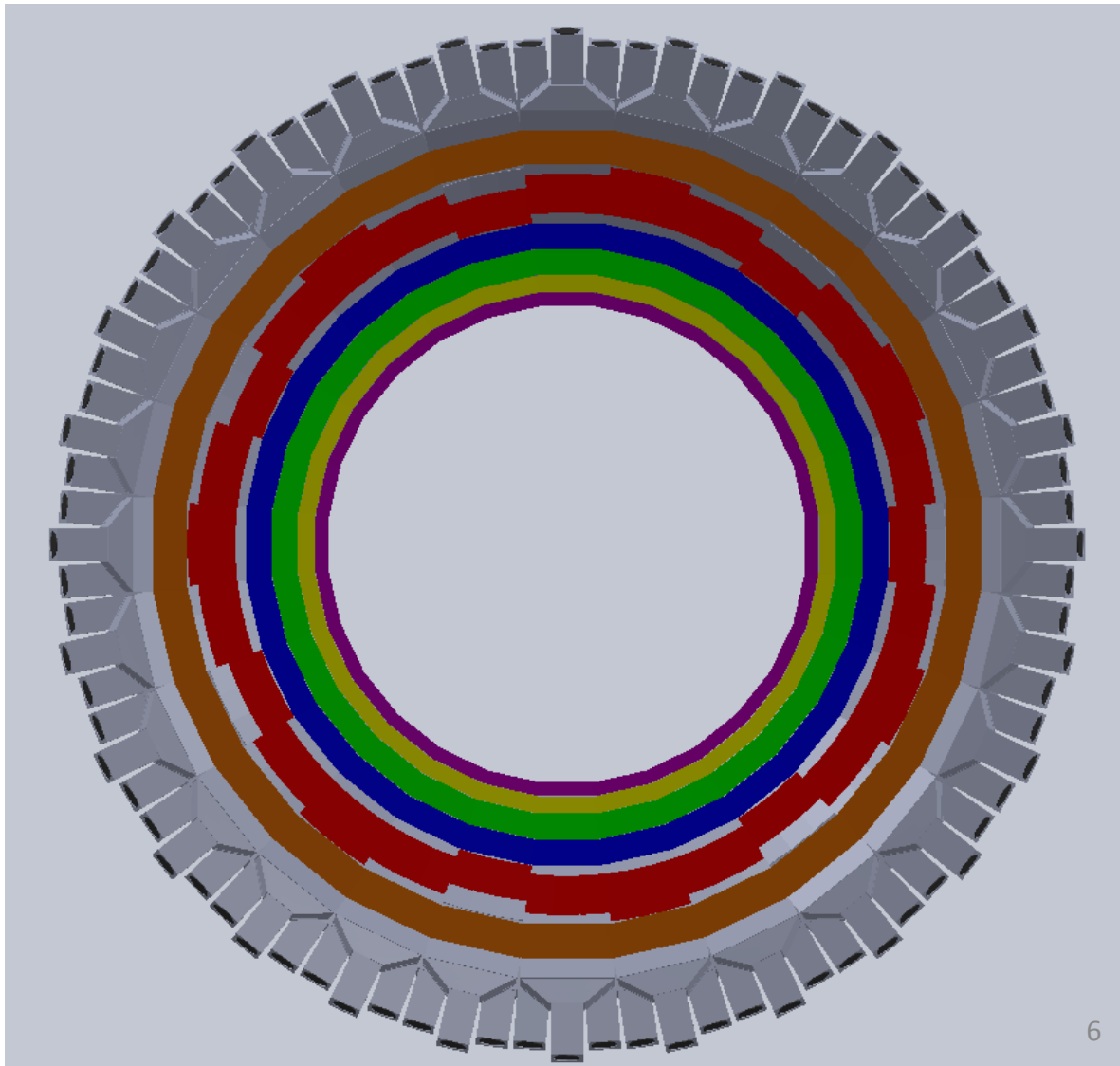
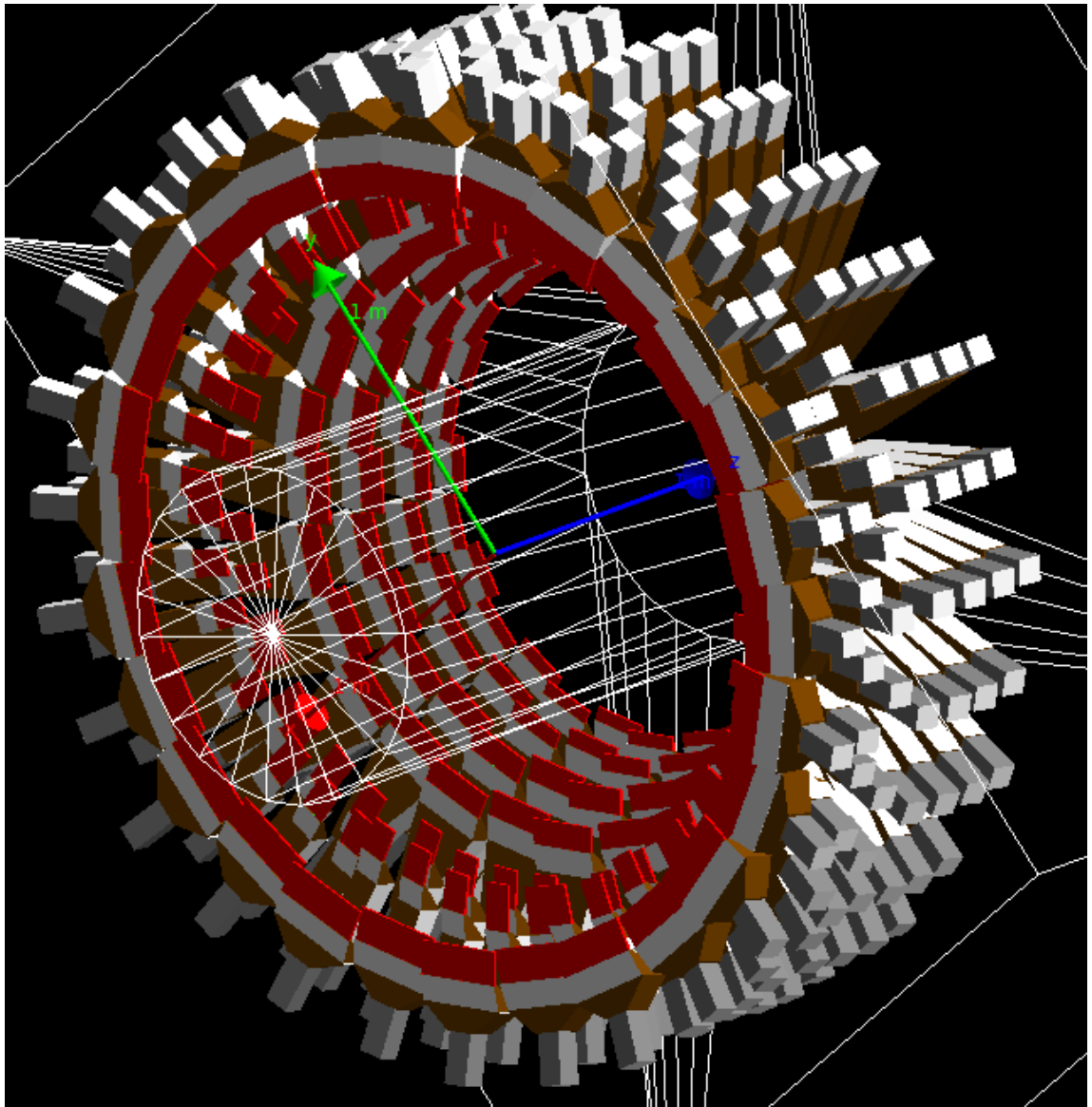


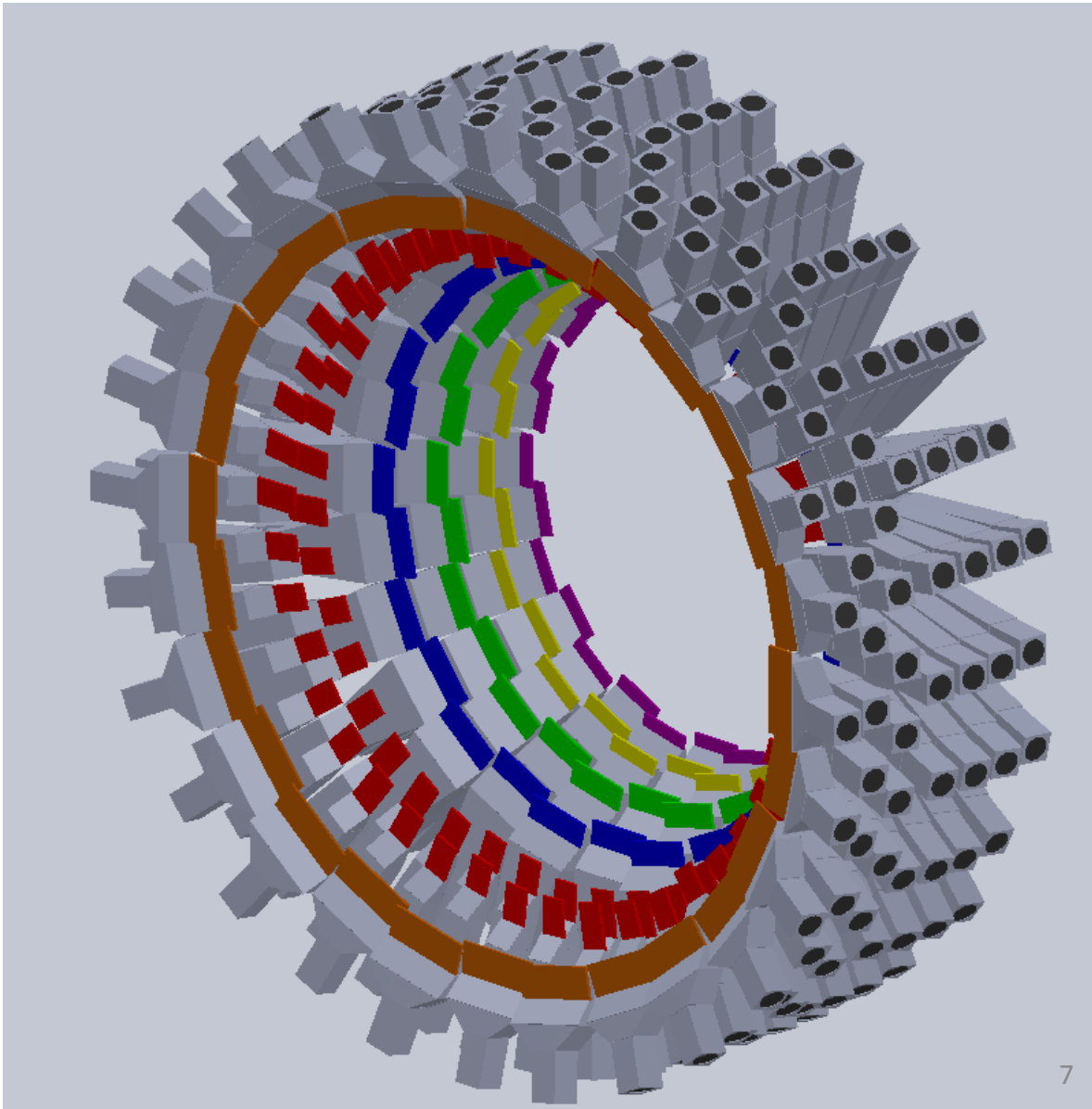
Implementation in GDML vs CAD:





Implementation in GDML vs CAD:

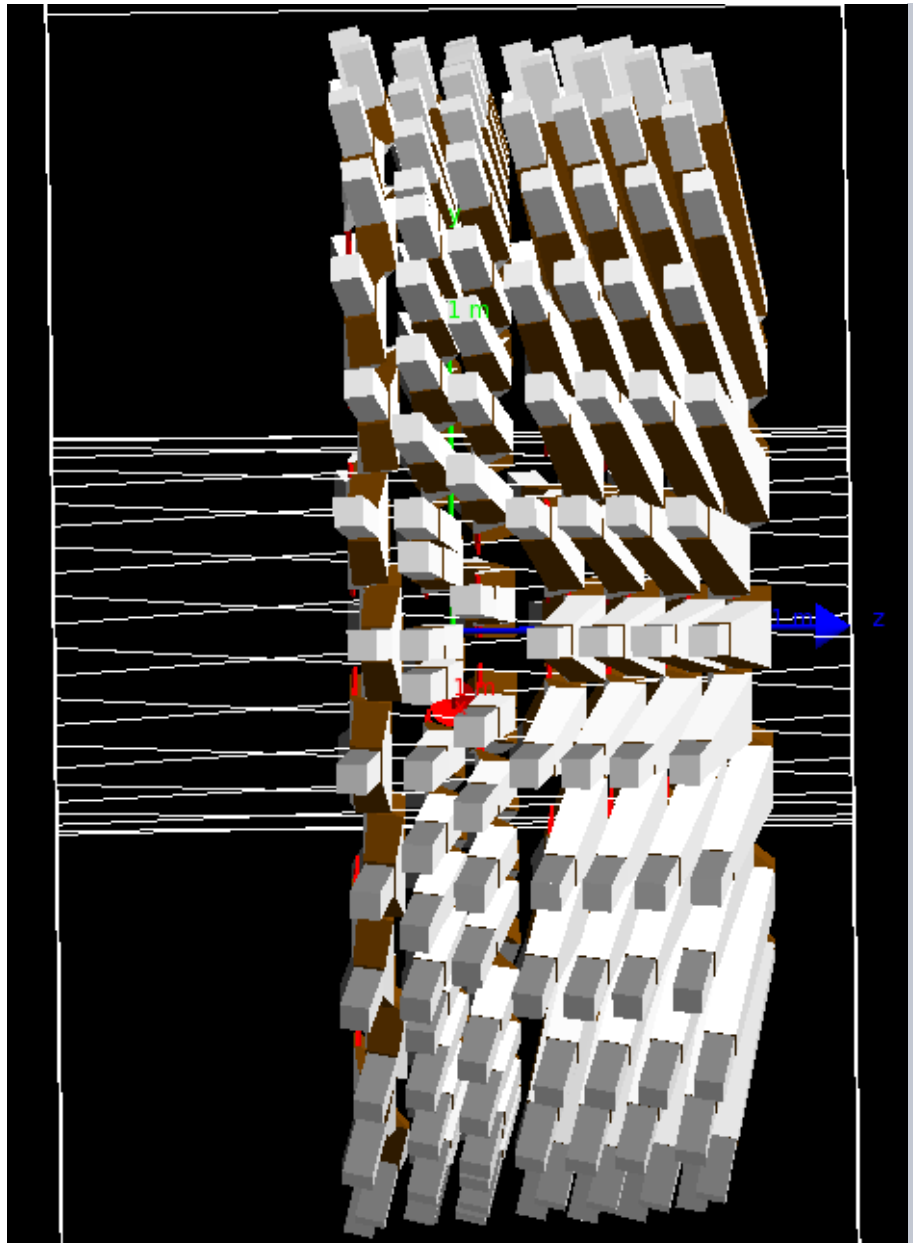


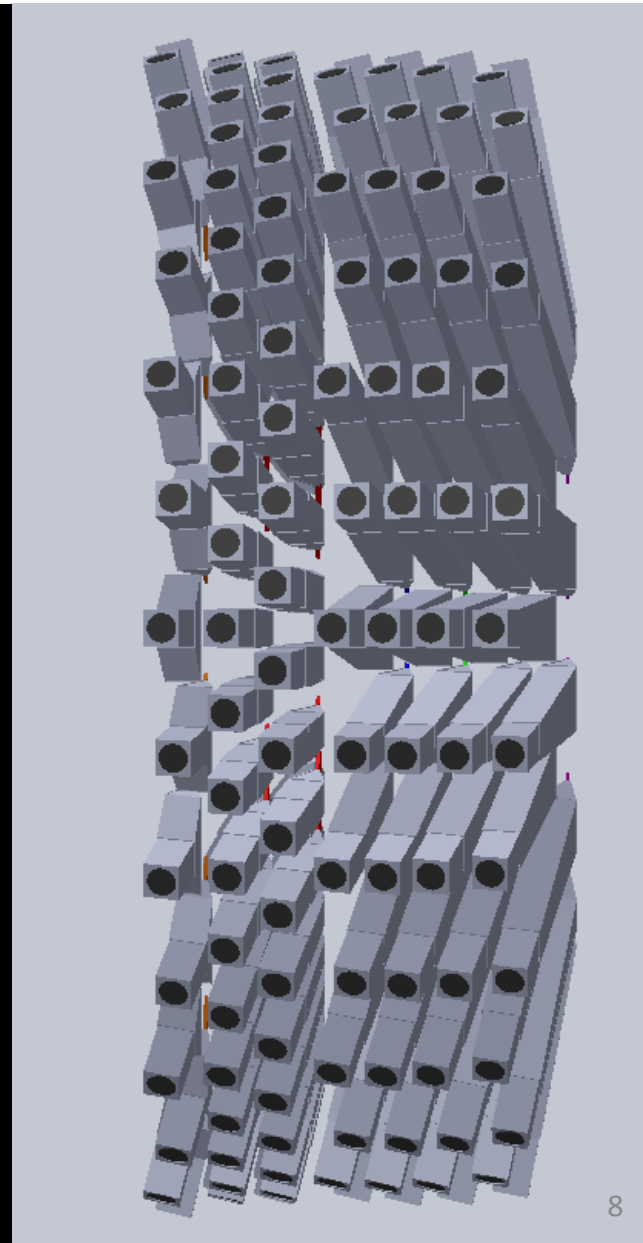


Implementation in GDML vs CAD:

So it’s a pretty good match all around and there are no overlaps.

There still remain a couple of points to update in the perl script:





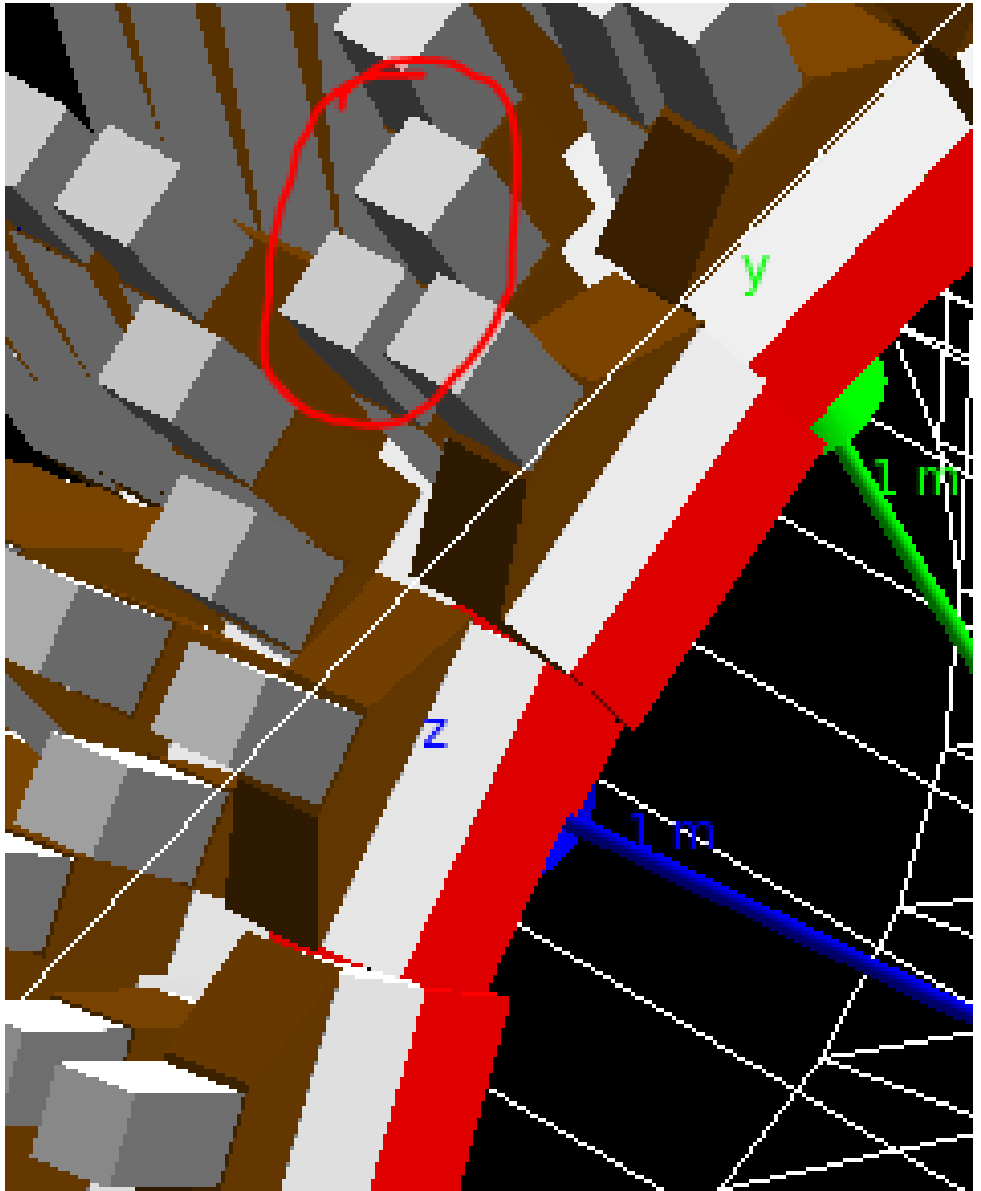
Implementation in GDML vs CAD:

There still remain a couple

of points to update in the

perl script:

- The neighboring tiles in ring 5 between two of the sub-segmentations should alternate in z.
- The angles for reflector and light guide are defined with the wrong sign.
- The PMT holder width (square) needs to be included as a new parameter in the perl framework.
- We need to finish converting the material properties and their tables from qsim into GDML readable format – undergrads are working on it.



Next steps:

- Keep up with the https://github.com/JeffersonLab/remoll-detector-generator github repo.
  - Fix those issues with the perl scripts.
  - Finish incorporating the qsim material definitions into the GDML framework.

- We need to fully incorporate this into git submoduling to keep track of geometries in remoll and use that to release standard versions for other people to use.

- I need to merge this geometry into the main MOLLER CAD assembly.
  - We need to design rudimentary support structure designs to hold this detector array together.
  - Send it on to engineers.