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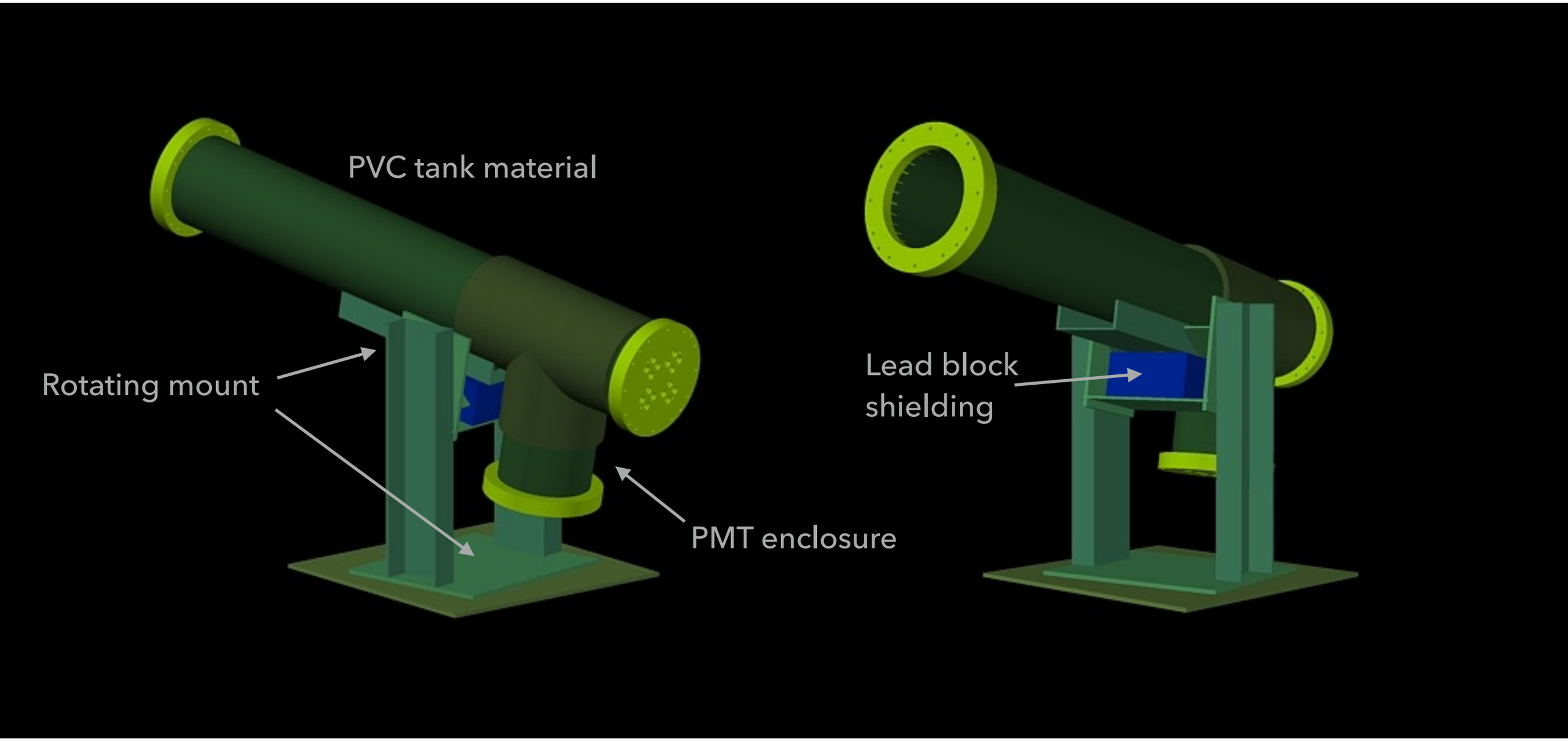
TEMPLE UNIVERSITY

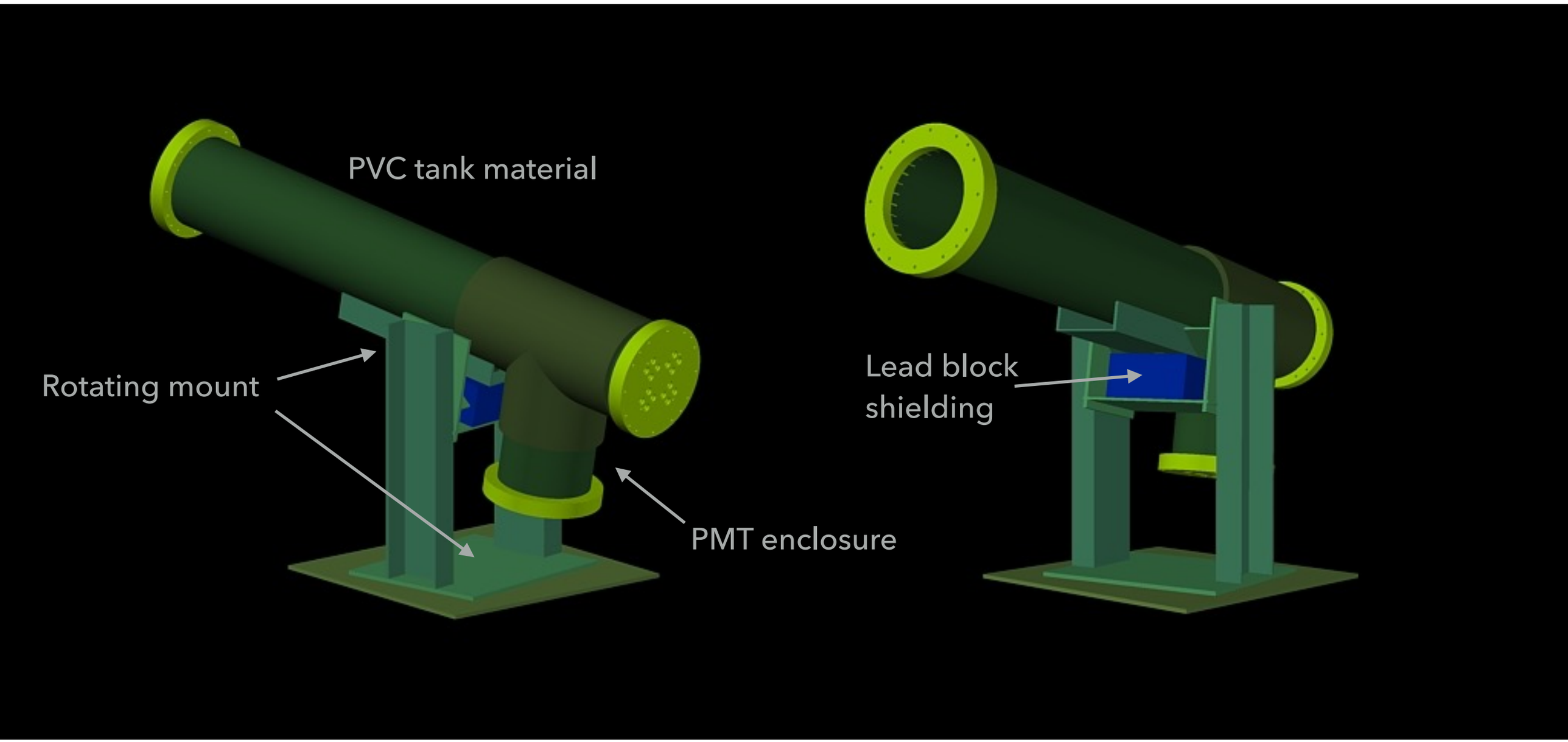
LGC UPDATE

BAZOOKA PROTOTYPE UPDATE



We are coordinating with Alex to parasitically test in Hall-A in October with other SoLID prototypes

~~BAZOOKA PROTOTYPE~~ ROTATABLE PROTOTYPE GAS CHERENKOV



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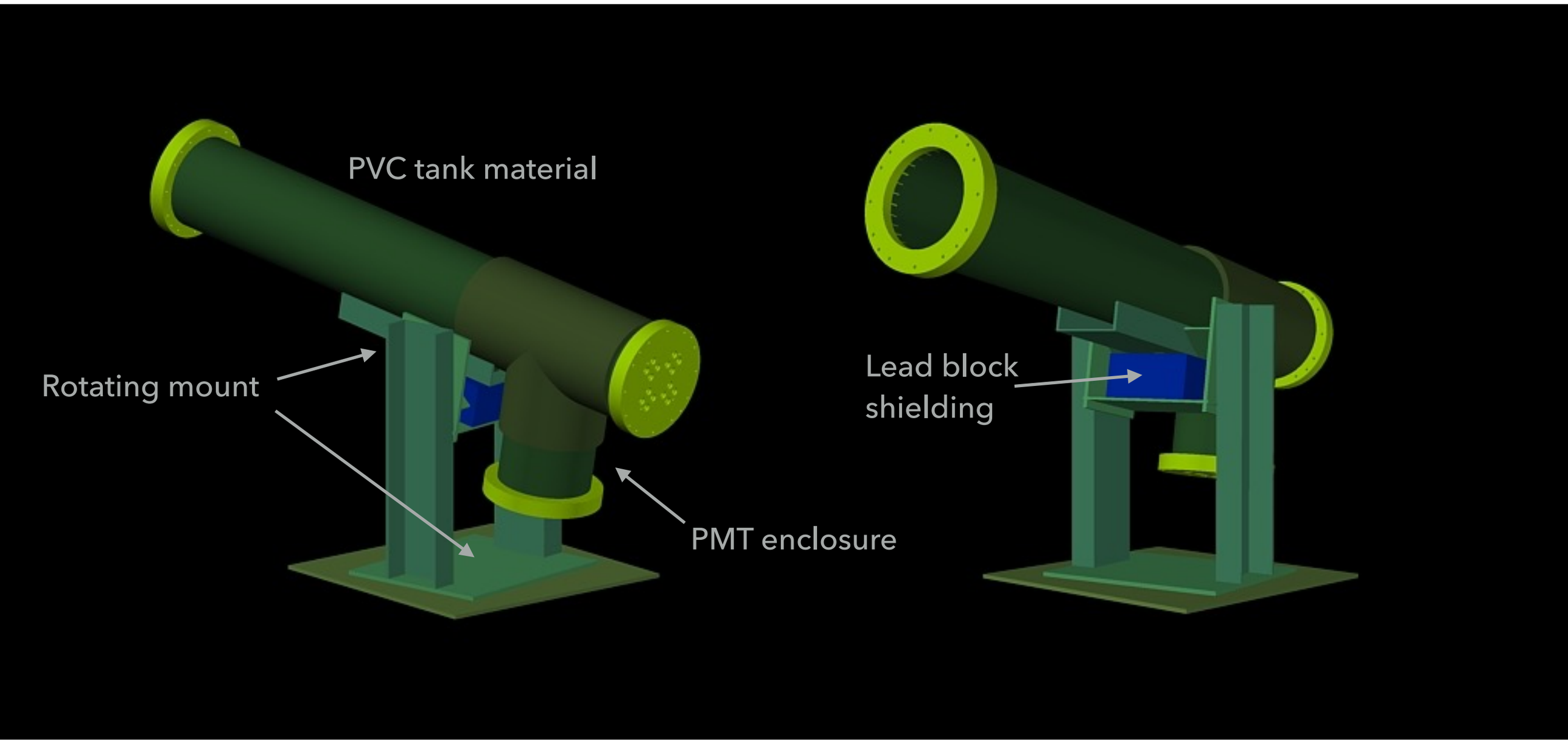

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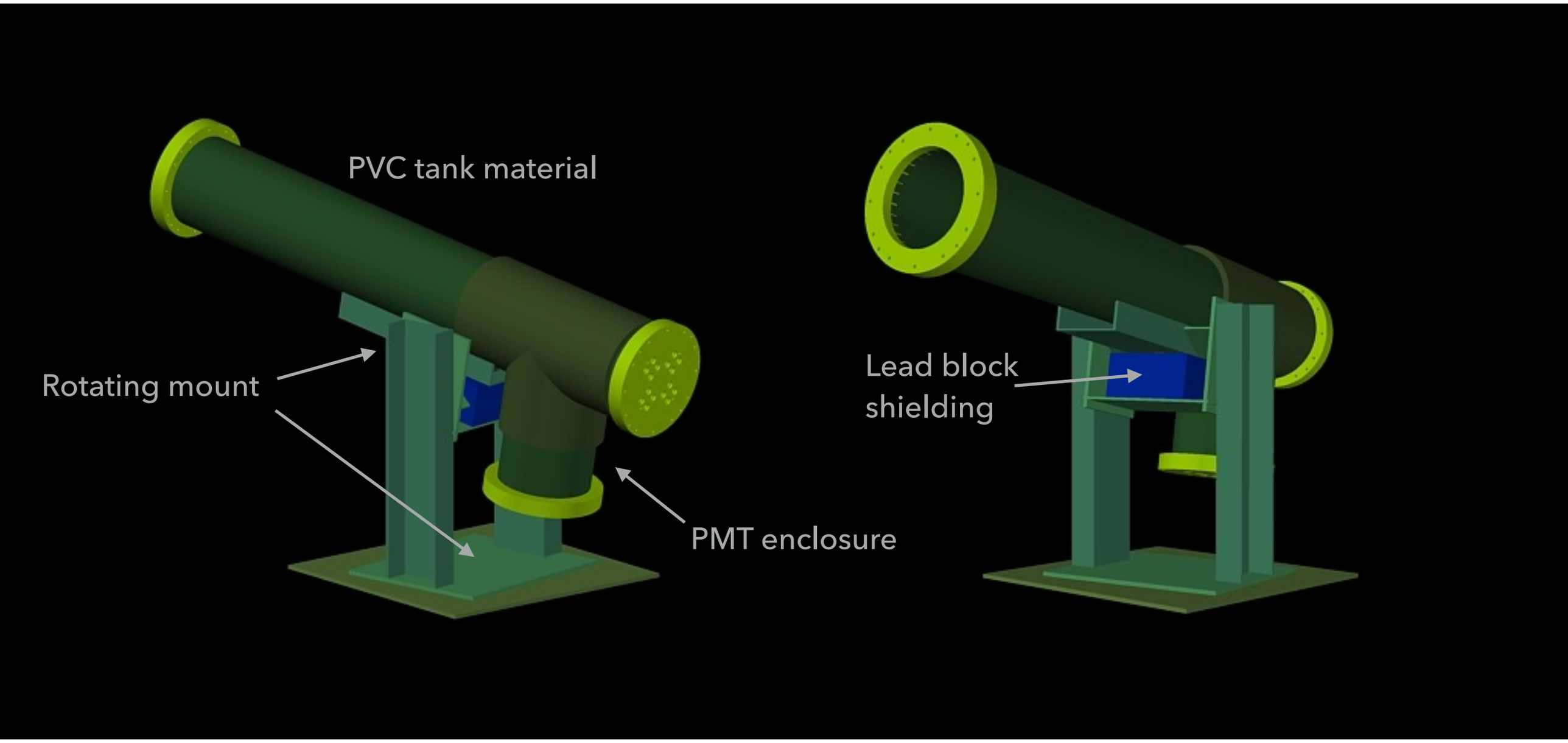
RPG CHERENKOV



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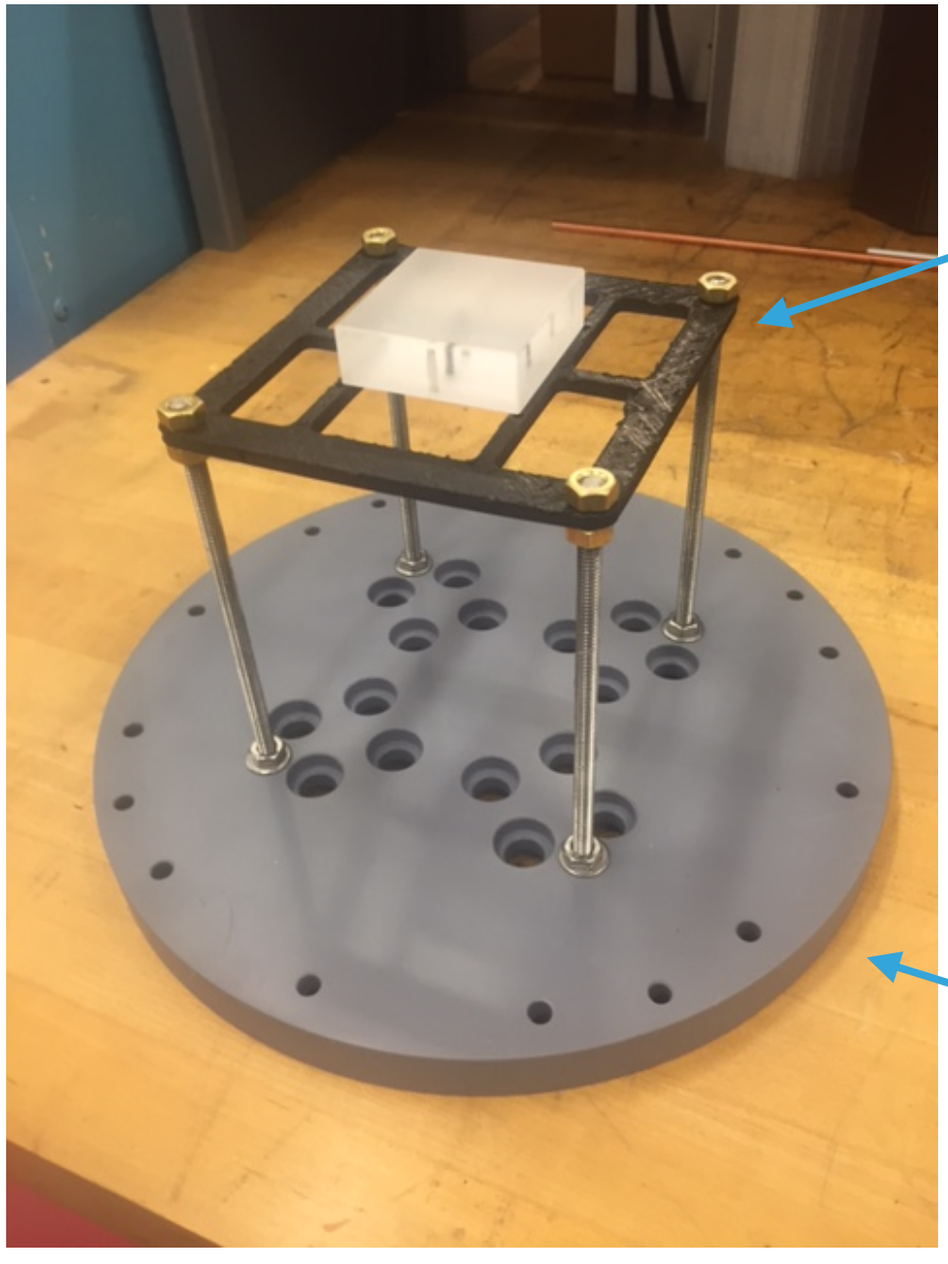
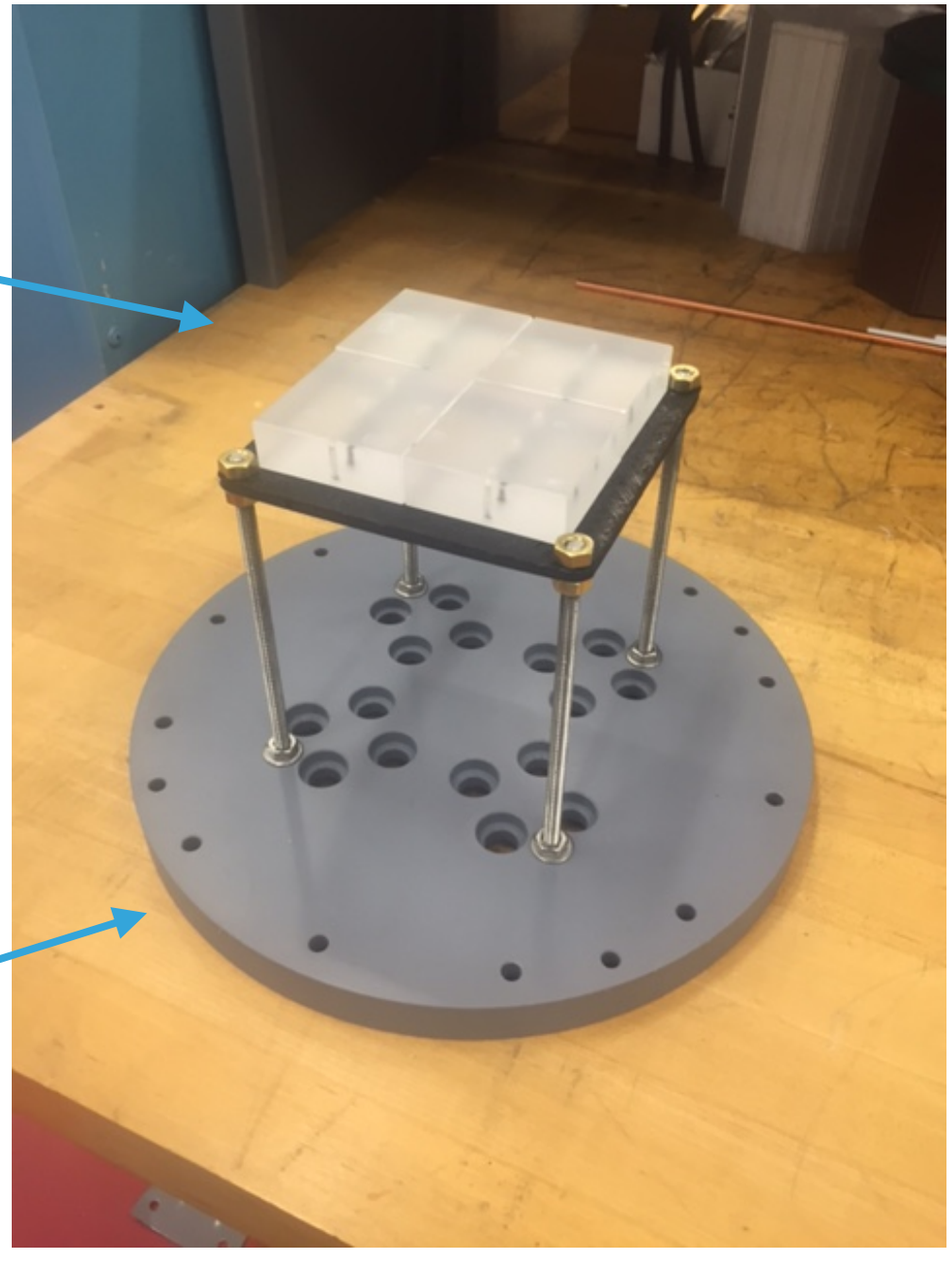


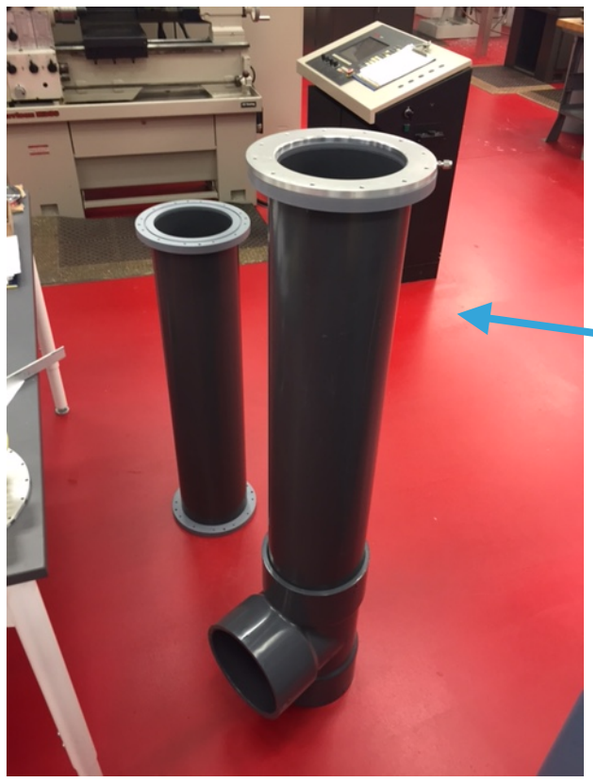
PMT mount can hold 1 to 4 Hamamatsu 12700 MaPMTs

End-plate with BNC cable ports (4 per PMT)



RPG CHERENKOV

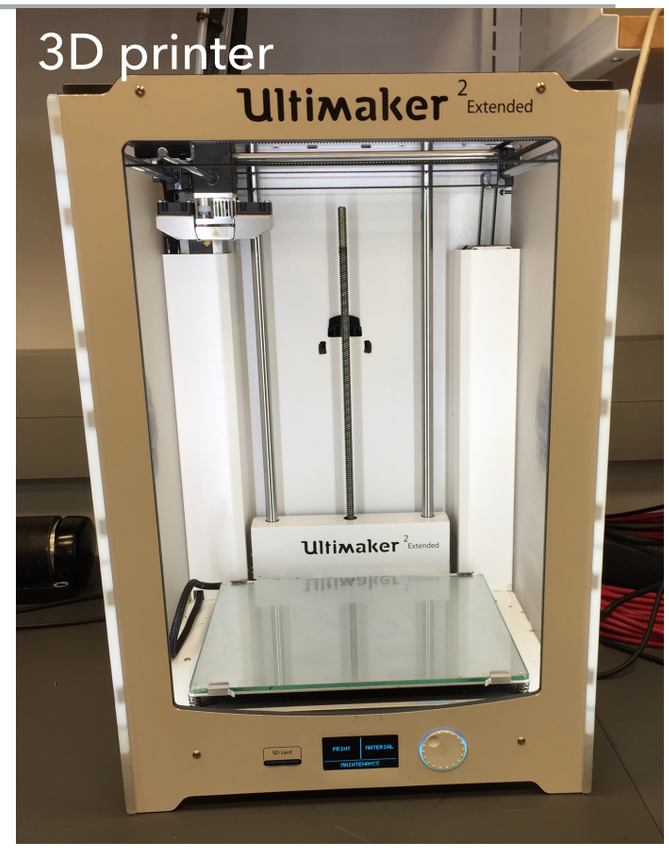
- End ring holds a .002" Aluminum window.
  - Fits on front and back.
  - Compression fitting.
  - Additional flange allows vacuum evacuation with very thin windows

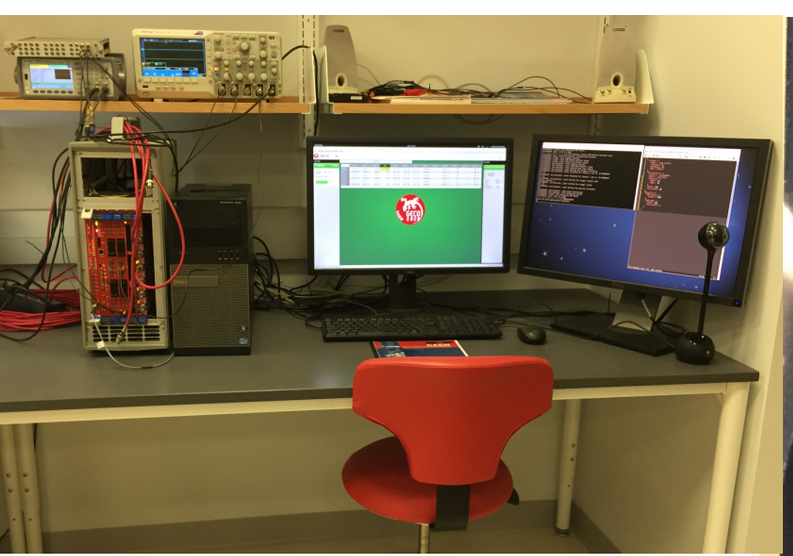


Base tube + extension

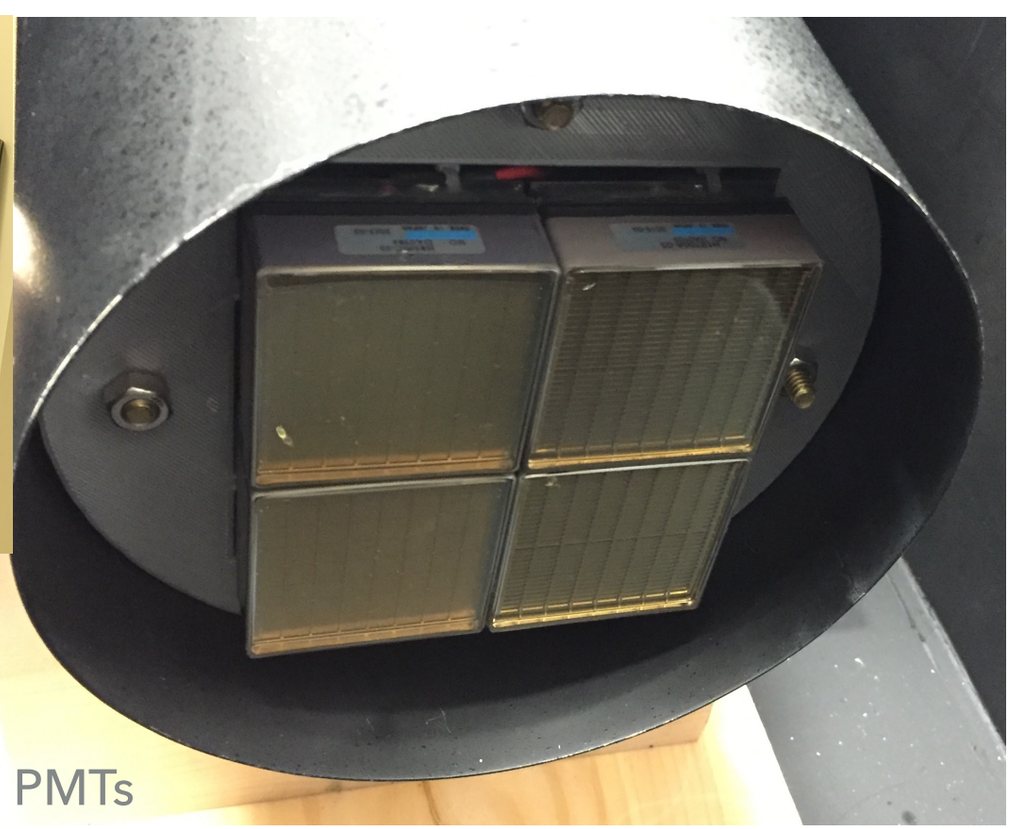
MAPMT TESTS

- Melanie Rehfuss (grad student at temple) has been testing a 2-PMT coincidence.
- 3D printed mount holds 4 MaPMTs
- Two LEDs are driven at different frequencies.
- Currently testing the accidental coincidence rate.

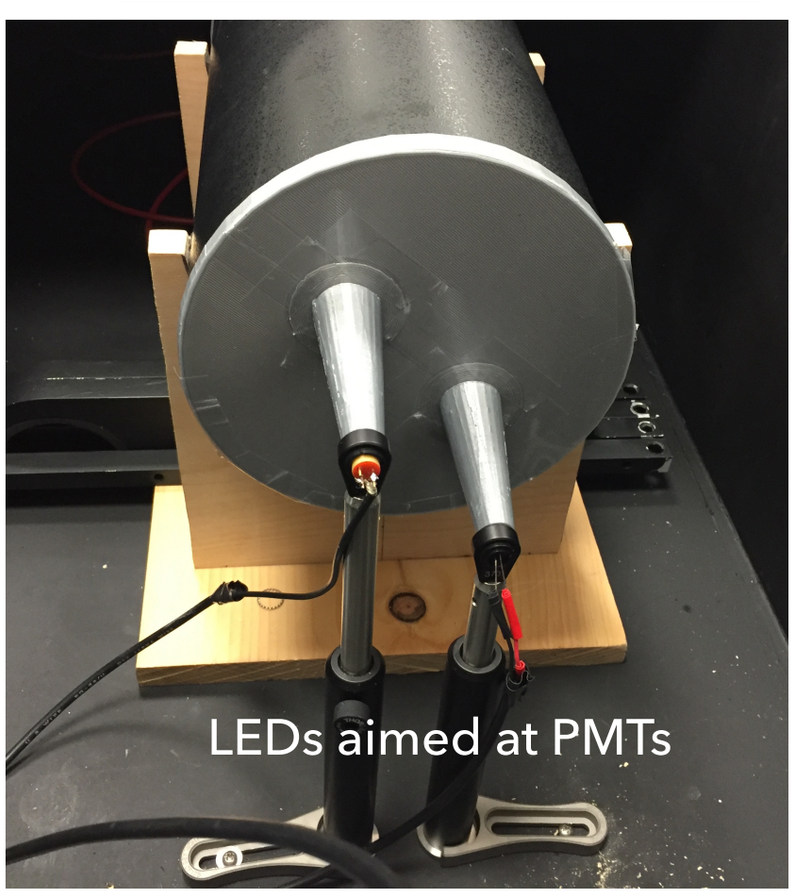




DAQ setup

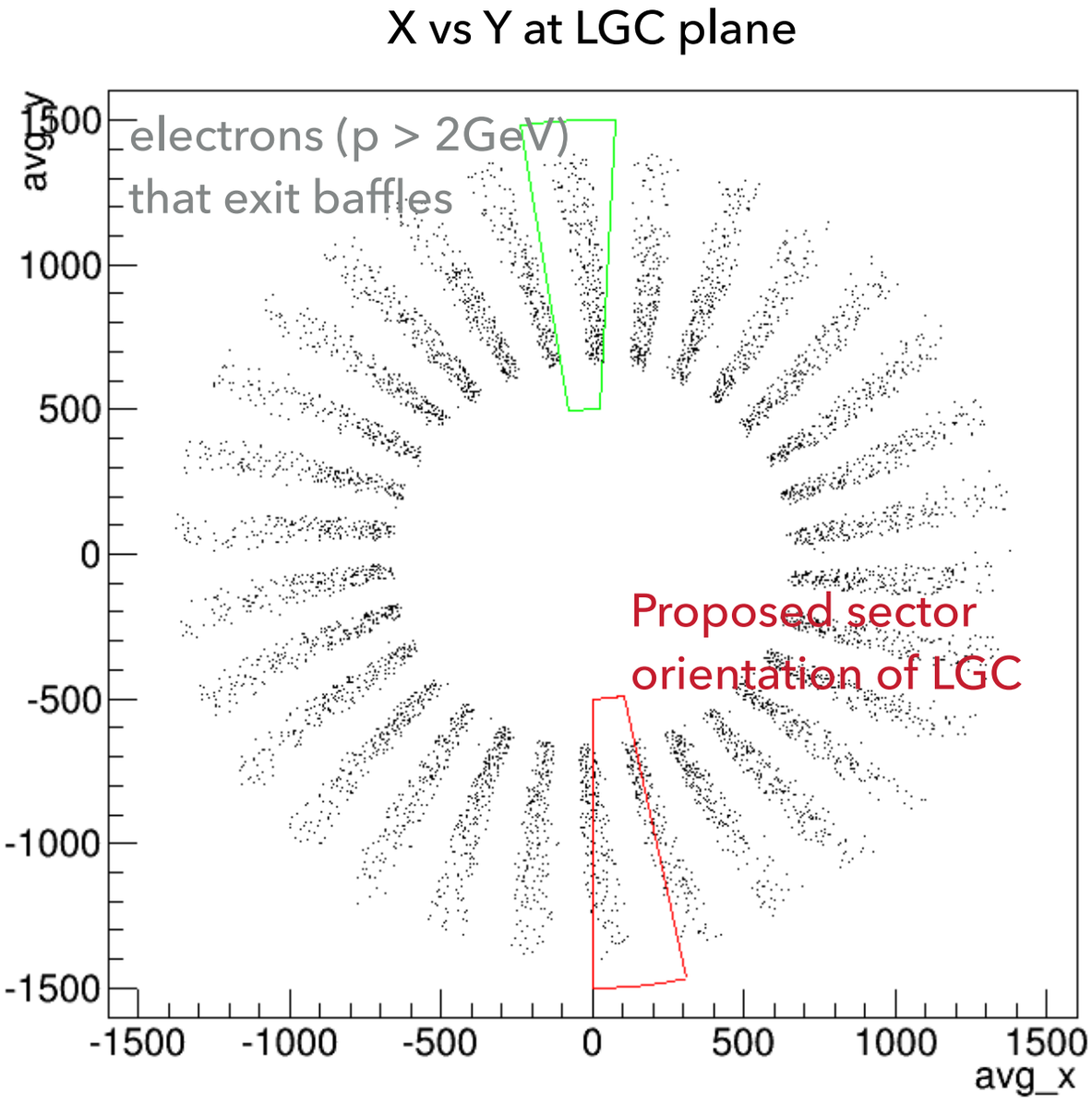


Mounted PMTs



SIMULATION UPDATES, ODDS AND ENDS

- PMT pixels were shrunk by 1 um per side to avoid “overlaps”
- Sector numbering has been brought in-line with other detectors.
- Exact rotation needs to be optimized with the baffle rotation.



PVDIS TRIGGER CONCERNS

- A note on the PVDIS trigger:
  - Trigger code is tunable to have a total number of PMTs with a PE threshold per PMT.
  - The trigger is historically 2x2.
    - Most open, safe trigger.
  - Using Zhiwen's latest files, for events that have exactly 1 electron pass into the LGC:
    - PVDIS signal electrons:
      - 2x2 config: 59562 events
      - 2x**3** config: 56449 events (~5% less)
    - PVDIS Hall-D π^0 background:
      - 2x2 config: 1722 events
      - 2x**3** config: 1045 events (~40% less)

PVDIS TRIGGER CONCERNS

- Changes since original 2x2 trigger:
  - Gas C_4H_8O / N_2 mixture -> CO_2 (reduction in optical photons at PMT)
  - PMT H8500 -> H12700 + WLS (gain in optical photons)
- A more in-depth, multi-dimensional study need to be done.
  - Geometrical changes should also be considered.
    - Blinders / reflective cone adjustments.
  - Signal acceptance versus background rejection needs to be constrained:
    - Best would be total precision of measurement (statistical and systematic).
      - non-trivial task

BACKUPS

OPEN TRIGGER MULTIPLICITY