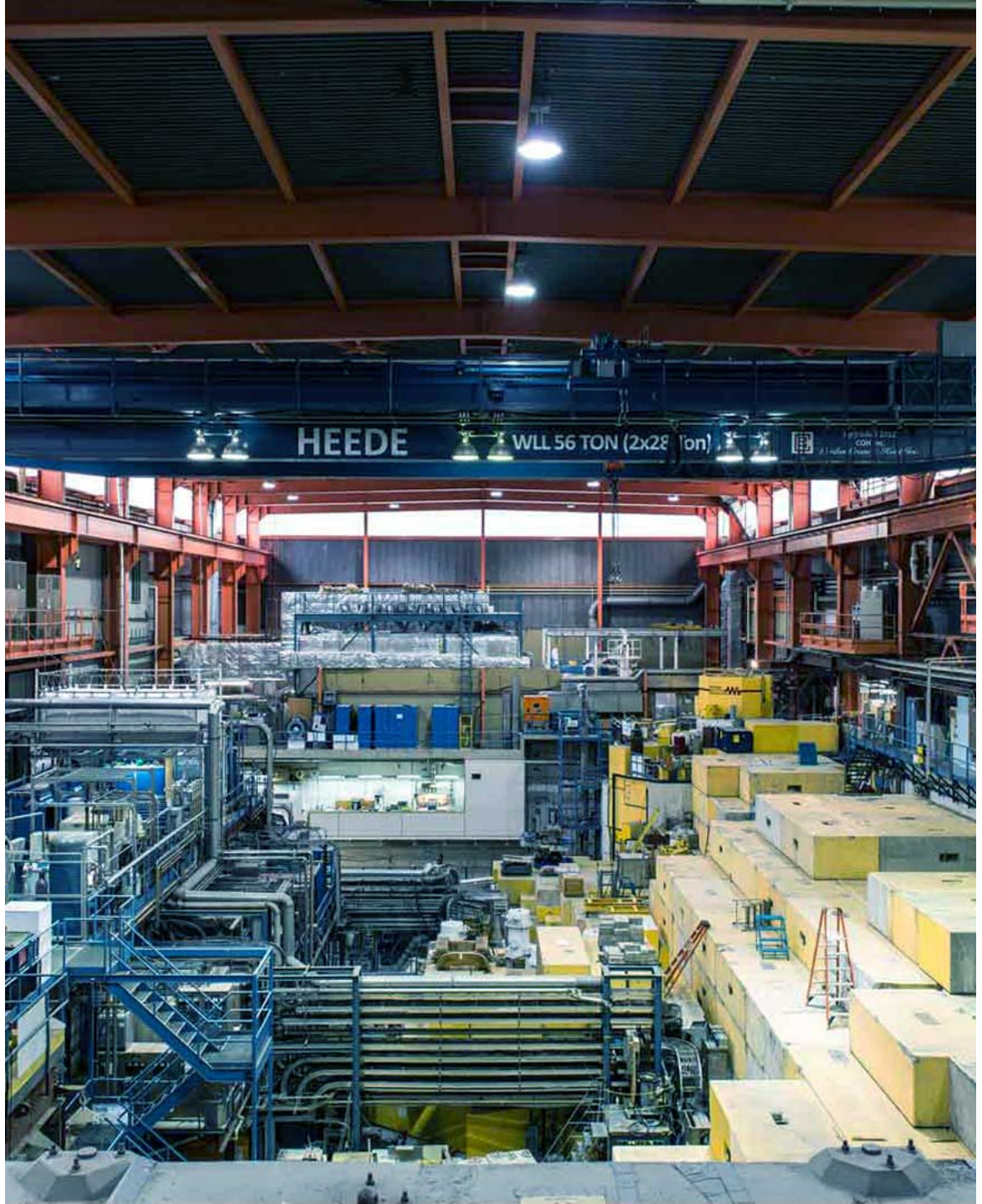
DarkLight Trigger System Status

Gabby Gelinas

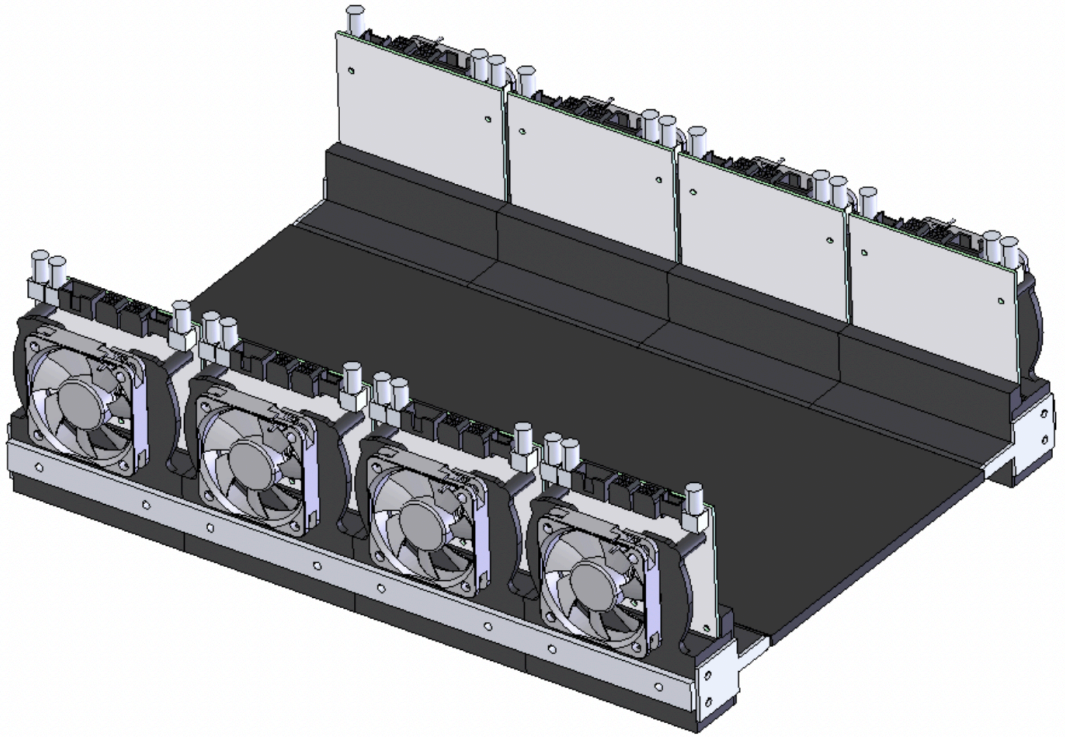
DarkLight Collaboration Meeting, January 15



2025-01-14

Equipment Status

Terminology Reminder:



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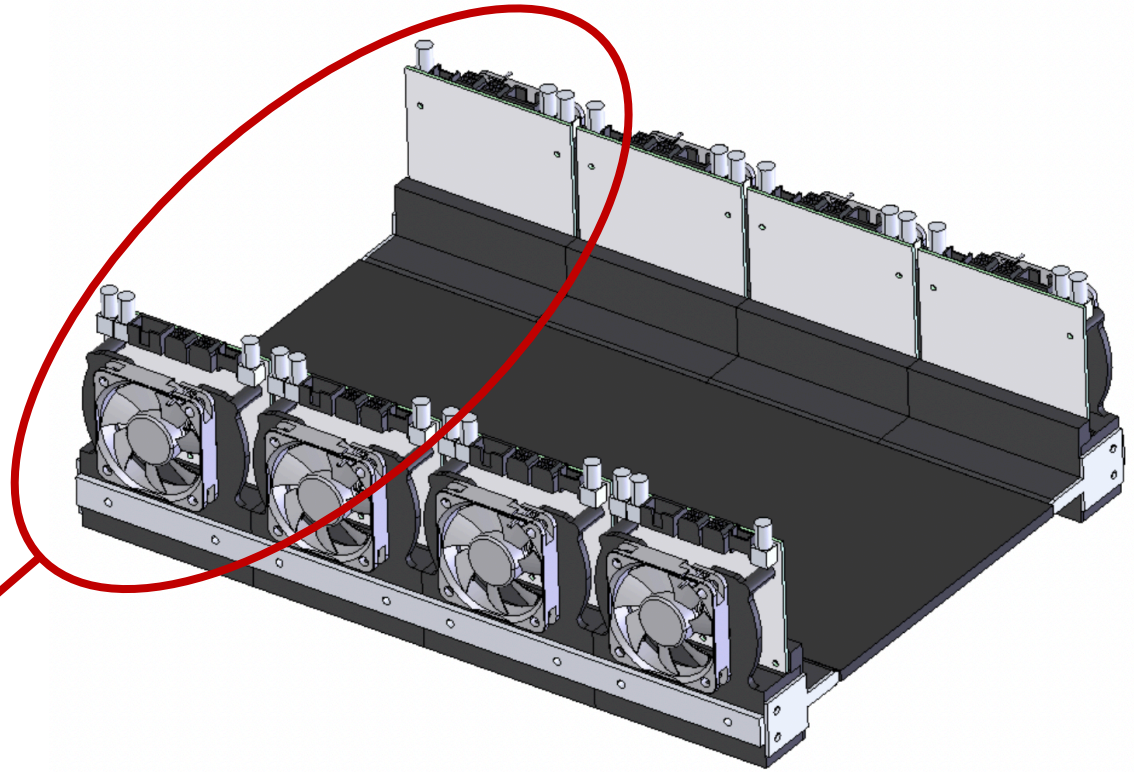
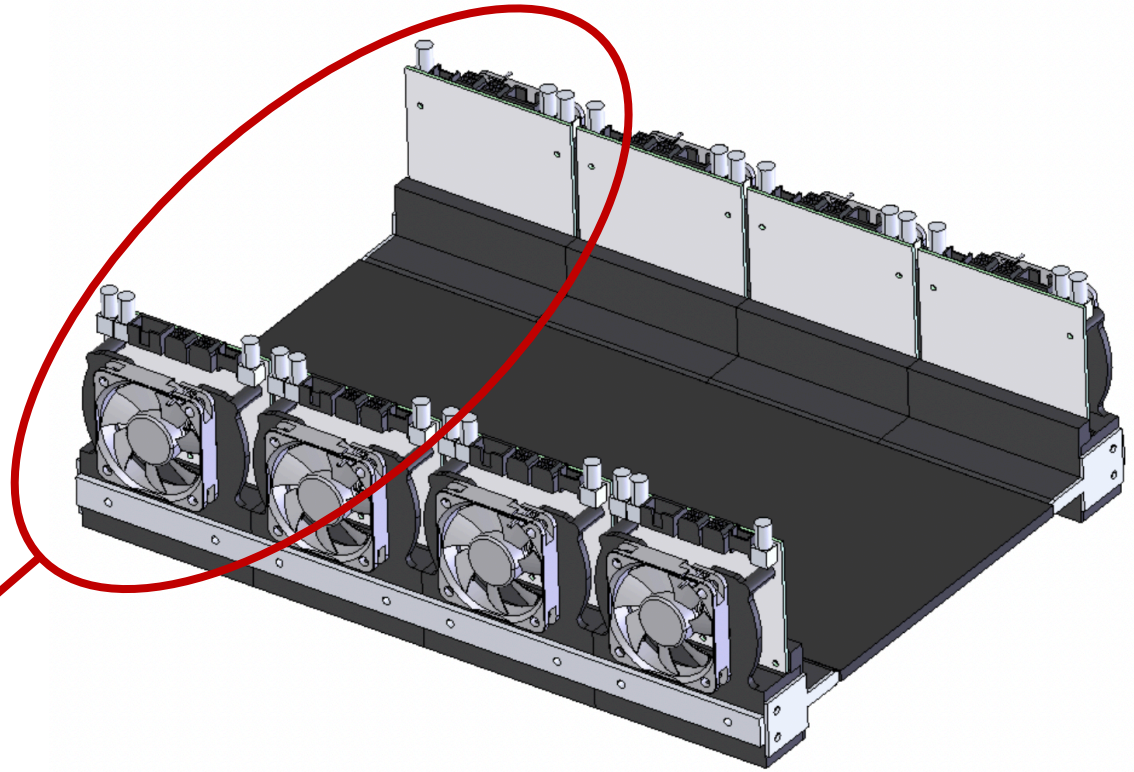


Paddle

Made of 2 scintillators

Equipment Status

Terminology Reminder:



Paddle

Made of 2 scintillators

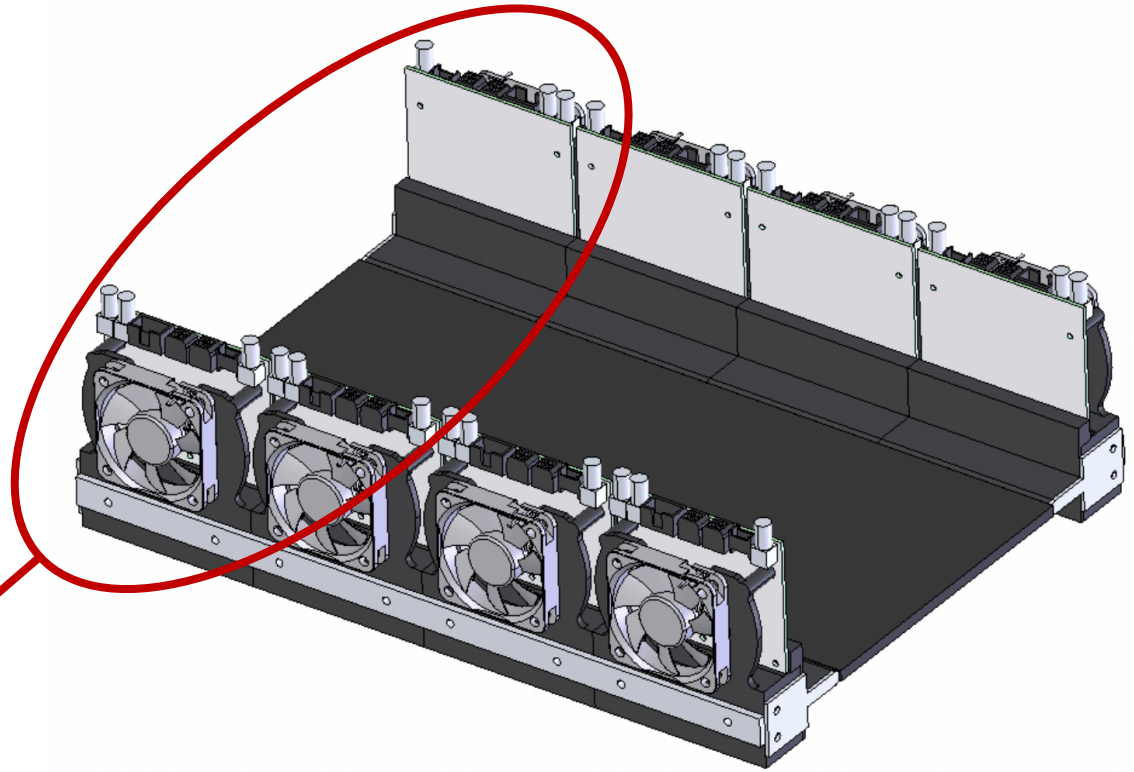
Set

Made of 4 paddles, or 8 scintillators

Equipment Status

Terminology Reminder:

Need a minimum of 10 paddles:
- 8 for installation
- 2 for continuous bench tests

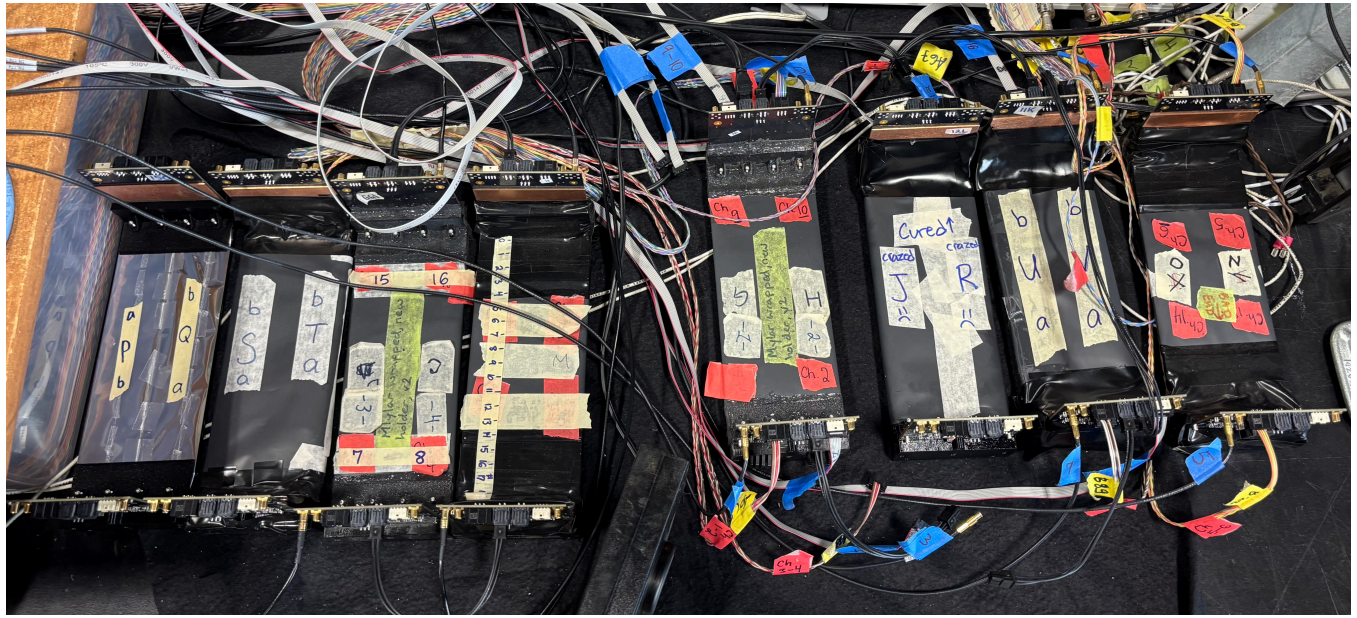


Paddle
Made of 2 scintillators

Set
Made of 4 paddles, or 8 scintillators

Equipment Status

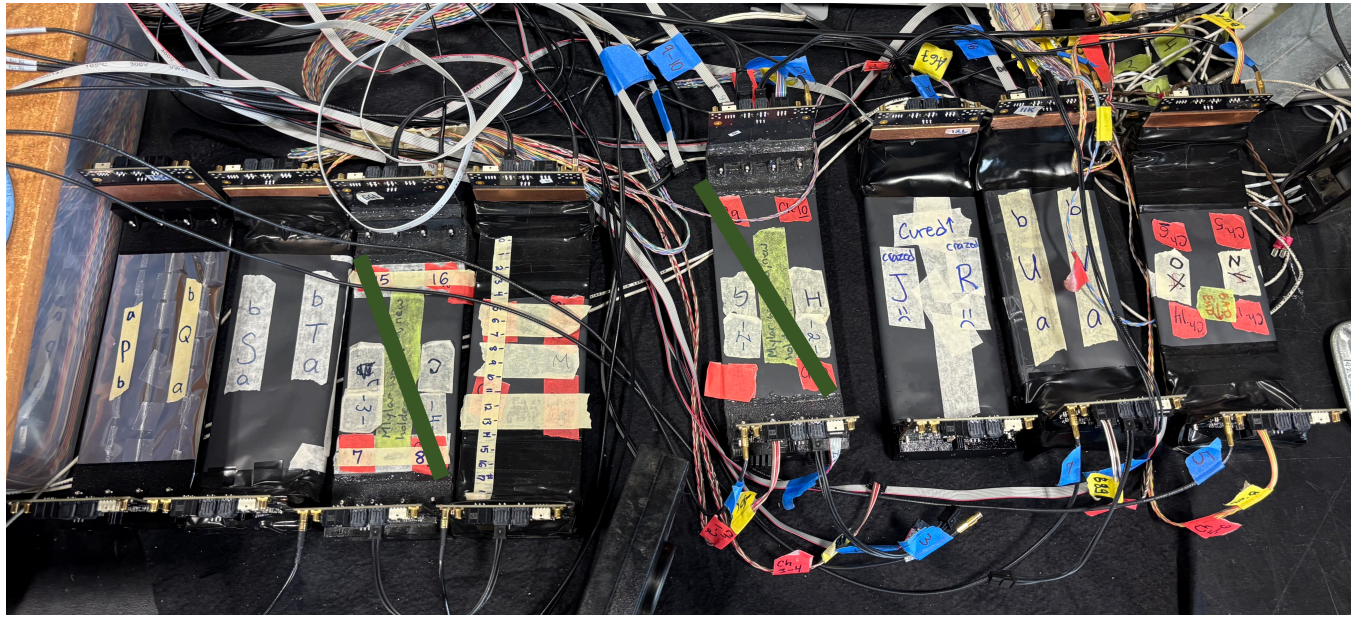
Have 8 assembled paddles:



Equipment Status

Have 8 assembled paddles:

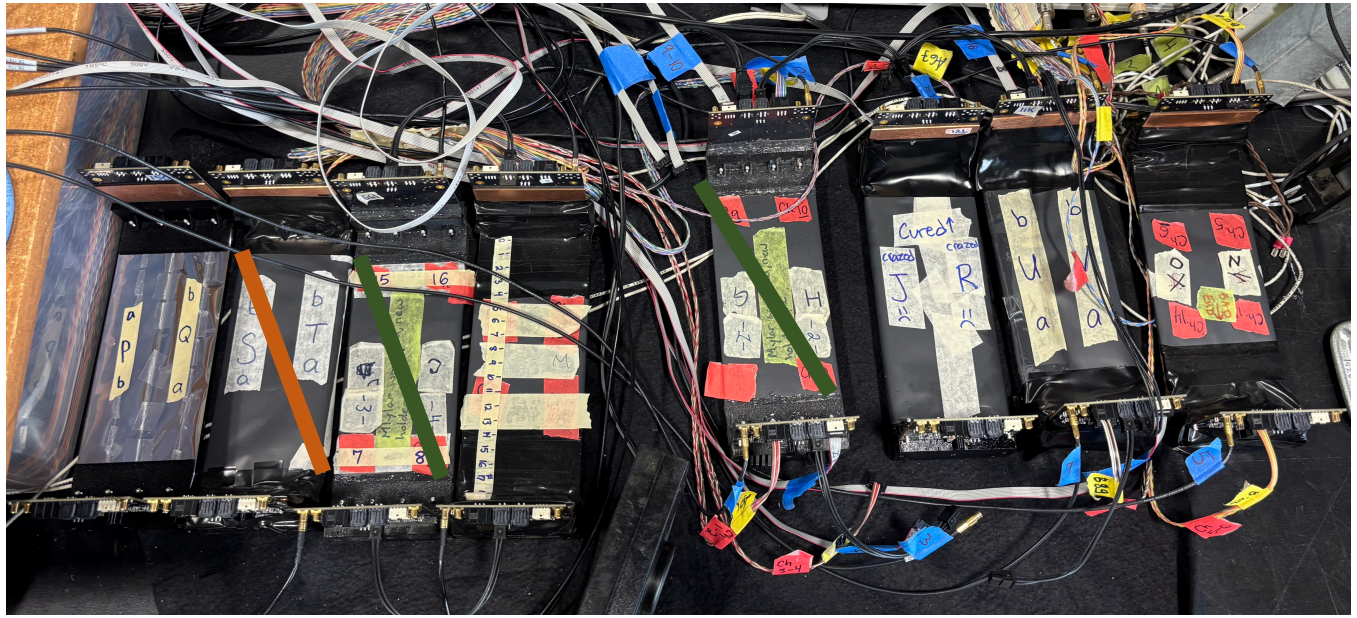
- 2 need copper plate added



Equipment Status

Have 8 assembled paddles:

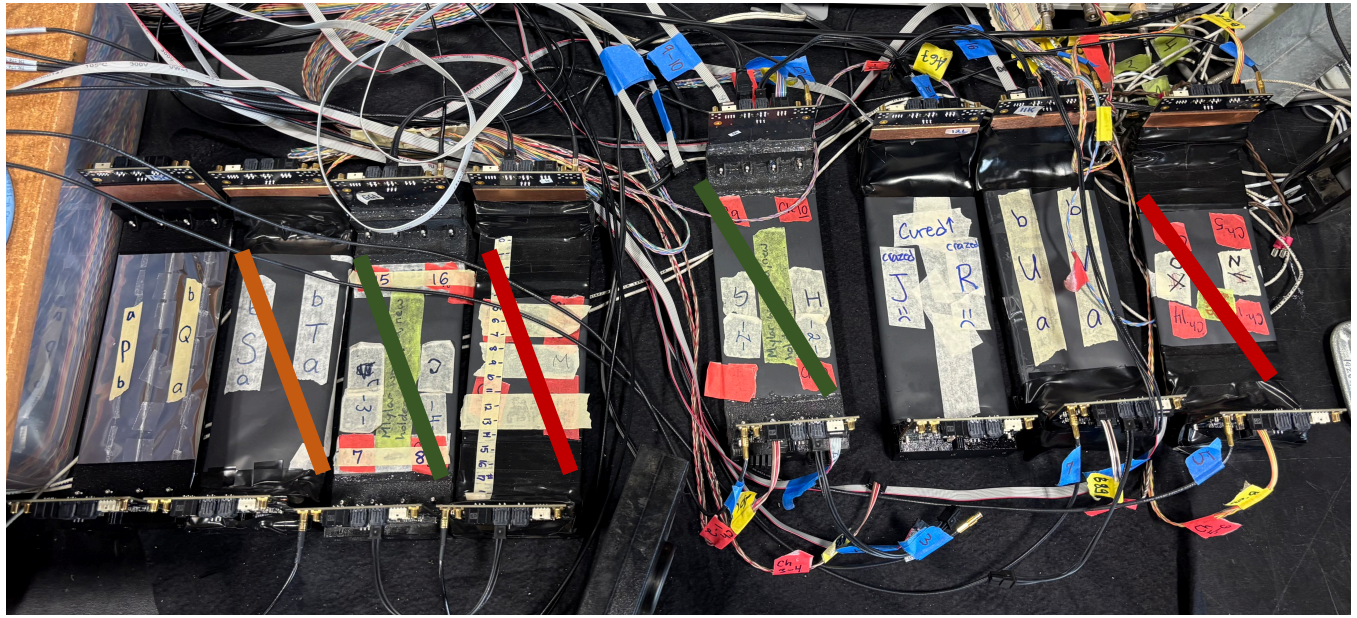
- 2 need copper plate added
- 1 needs the coupling agent changed



Equipment Status

Have 8 assembled paddles:

- 2 need copper plate added
- 1 needs the coupling agent changed
- 2 need the holder changed*



*Could be avoided for one by using it in the permanent test setup

Equipment Status

Have 8 assembled paddles:

- 2 need copper plate added
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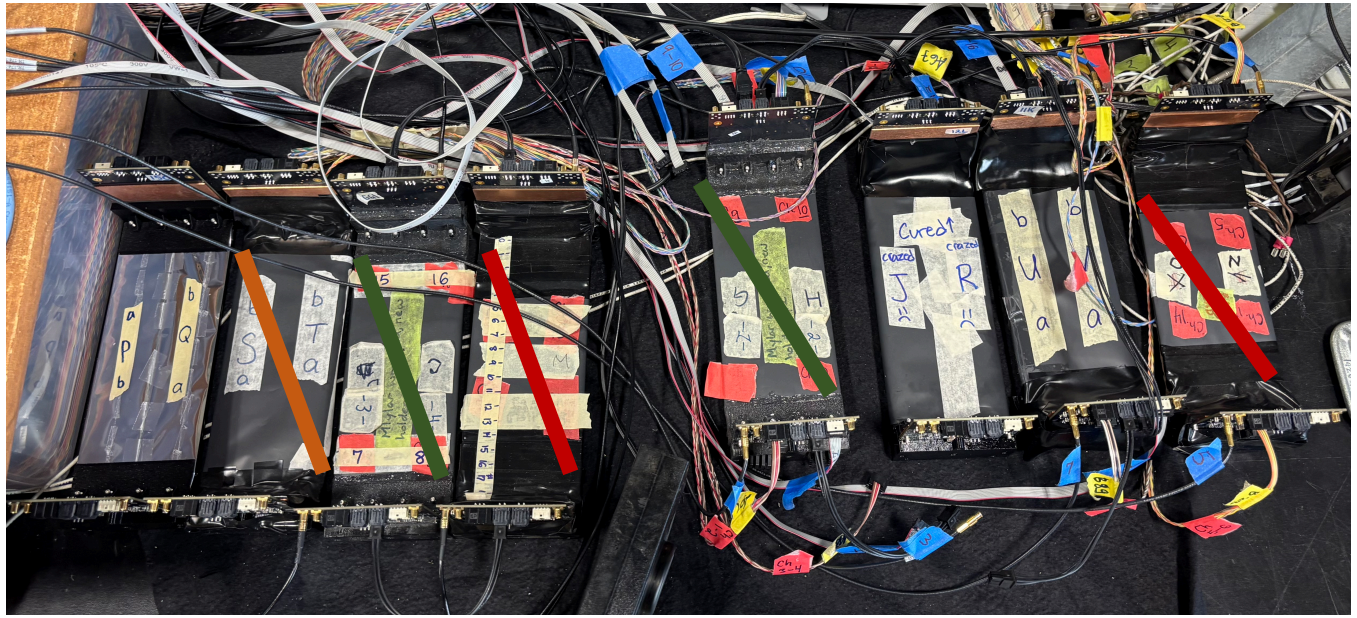
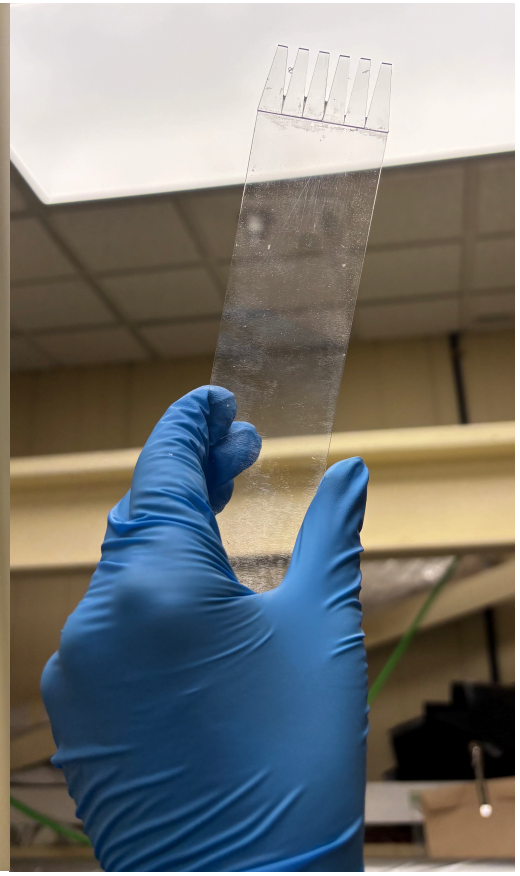


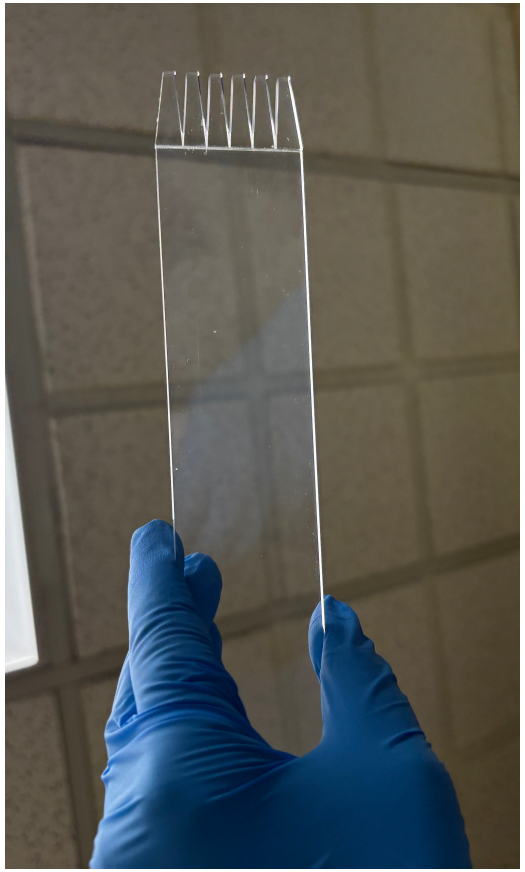
*Could be avoided for one by using it in the permanent test setup

4/10 paddles ready

Can produce up to 4 half paddles per day

Equipment Status – Scintillator Quality





Equipment Status – Scintillator Quality

Known Crazing Level		Unknown Crazing Level	
Assembled	Loose	Assembled	Loose
8	1	8	5

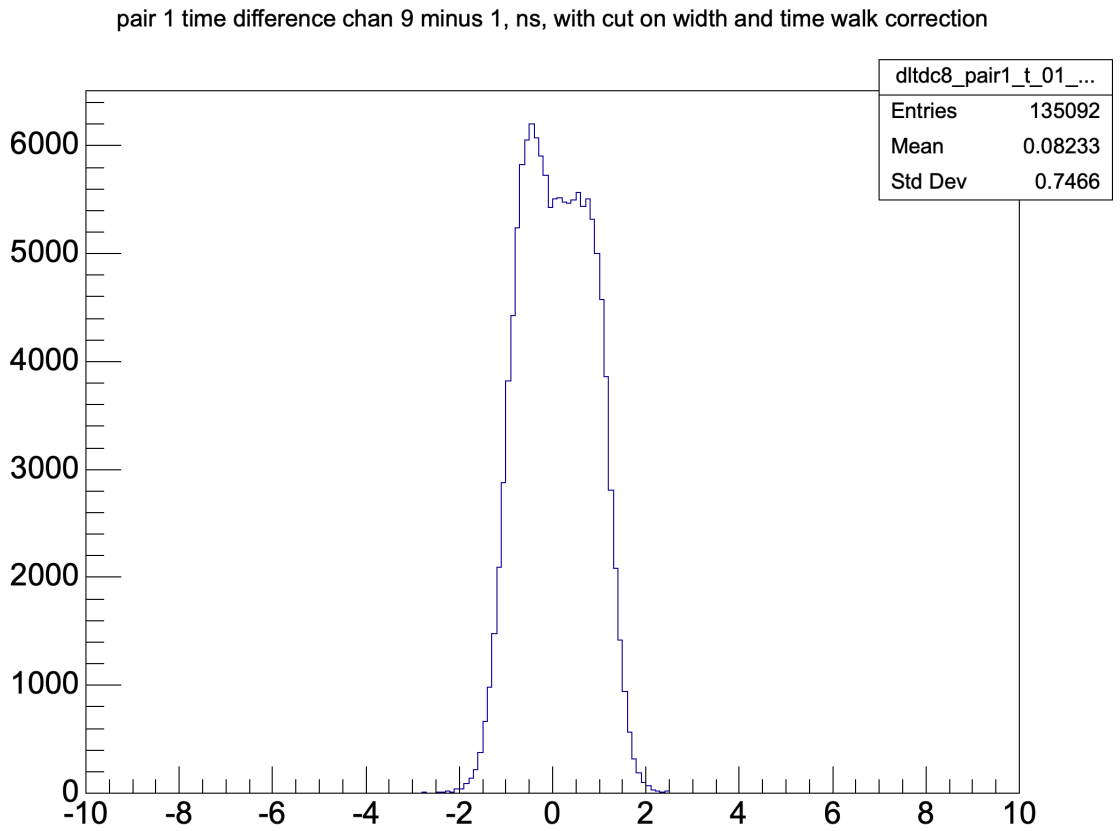
6 with low/moderate crazing
3 with high crazing

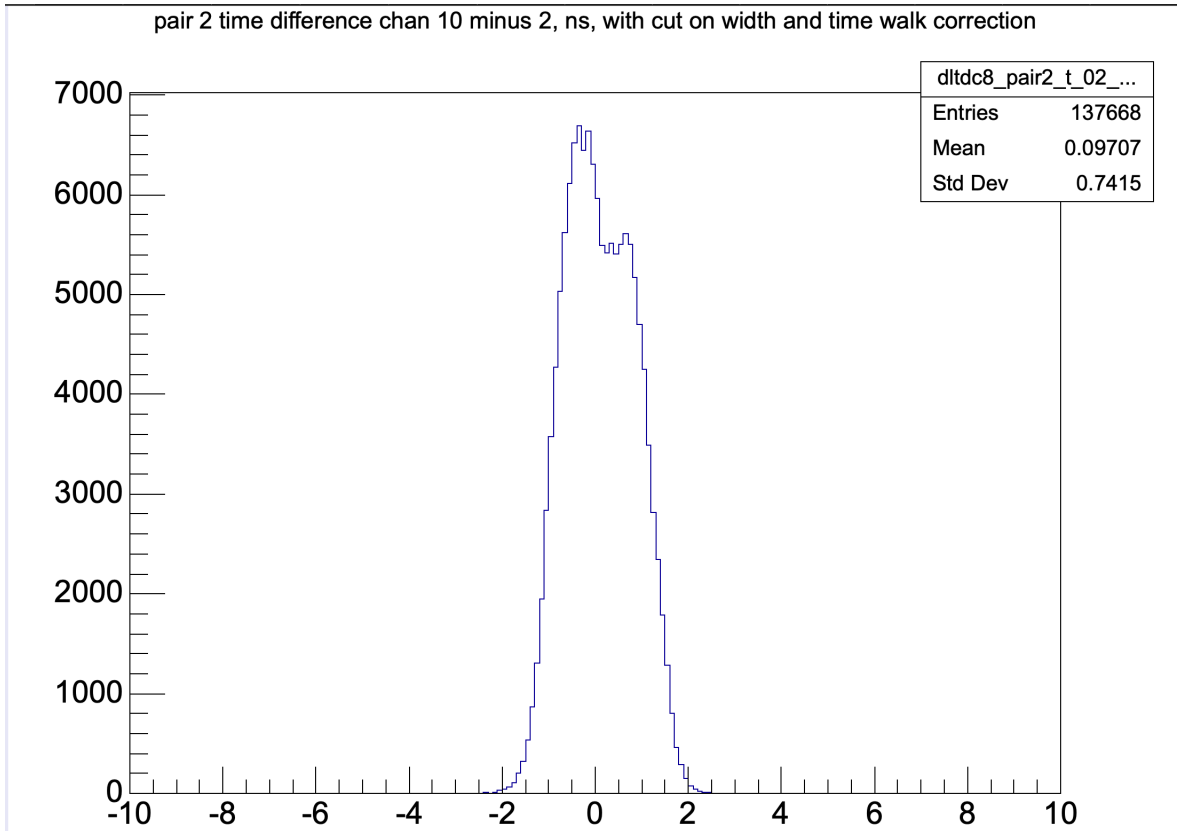
Total of 22 scintillators of 17 cm length:

- Full DarkLight assembly plus 2 spares
- One is used for benchtop assembly
- Use a 15 cm long scintillator to complete the benchtop assembly

Assembly is paused pending the results of a scintillator quality test

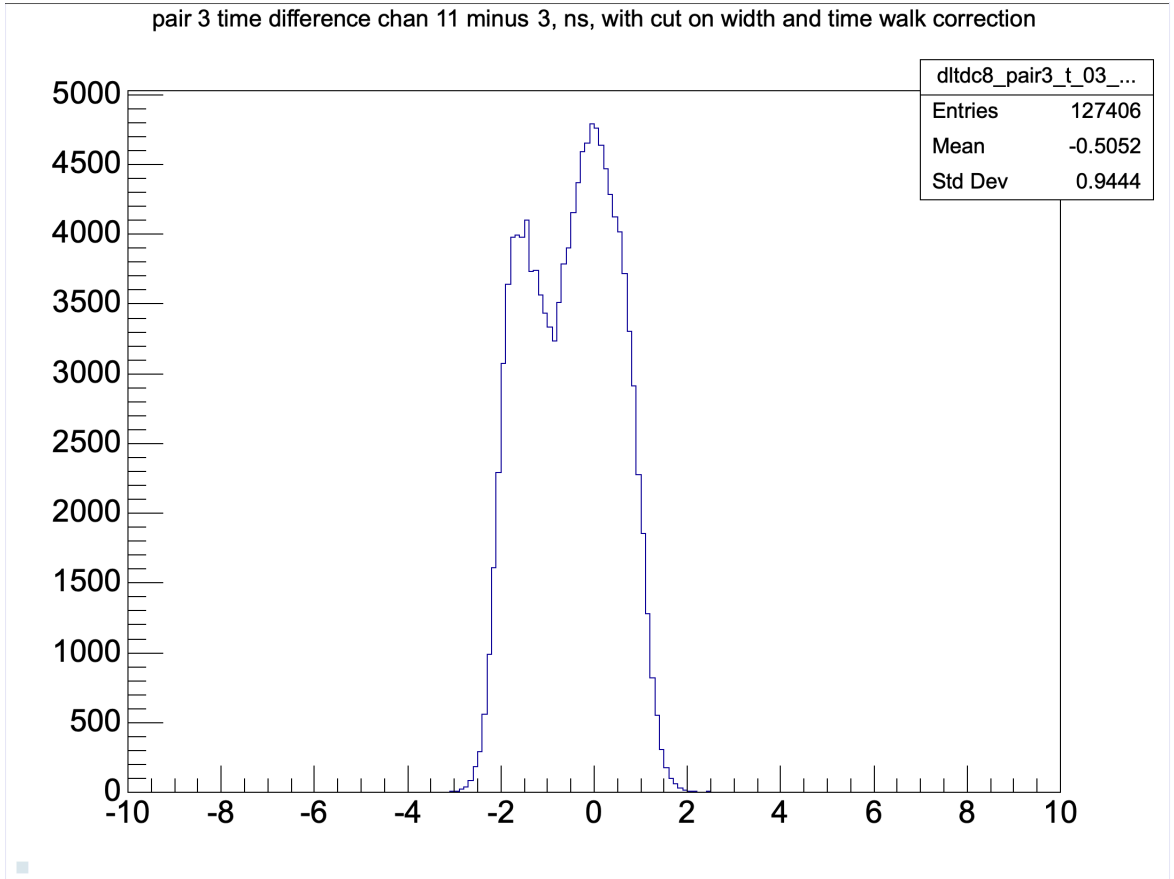
Equipment Status – Scintillator Quality

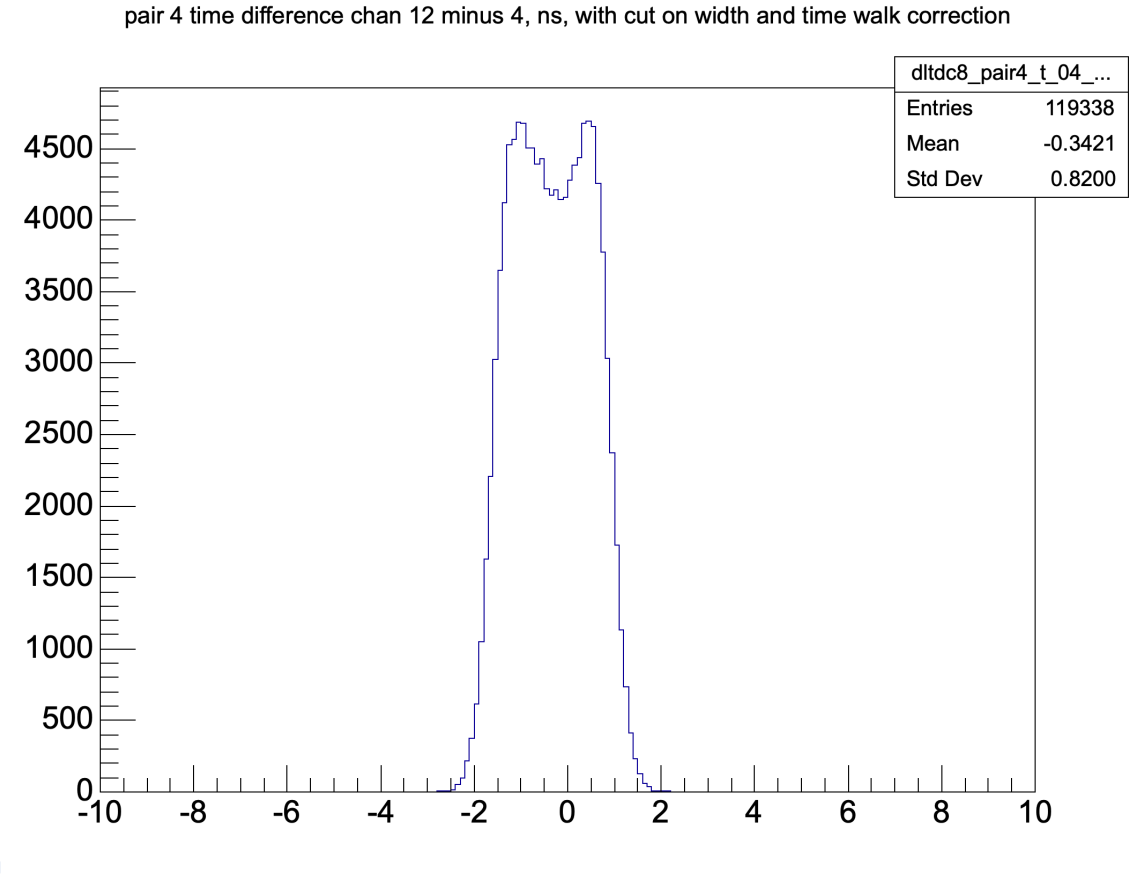




Low crazing

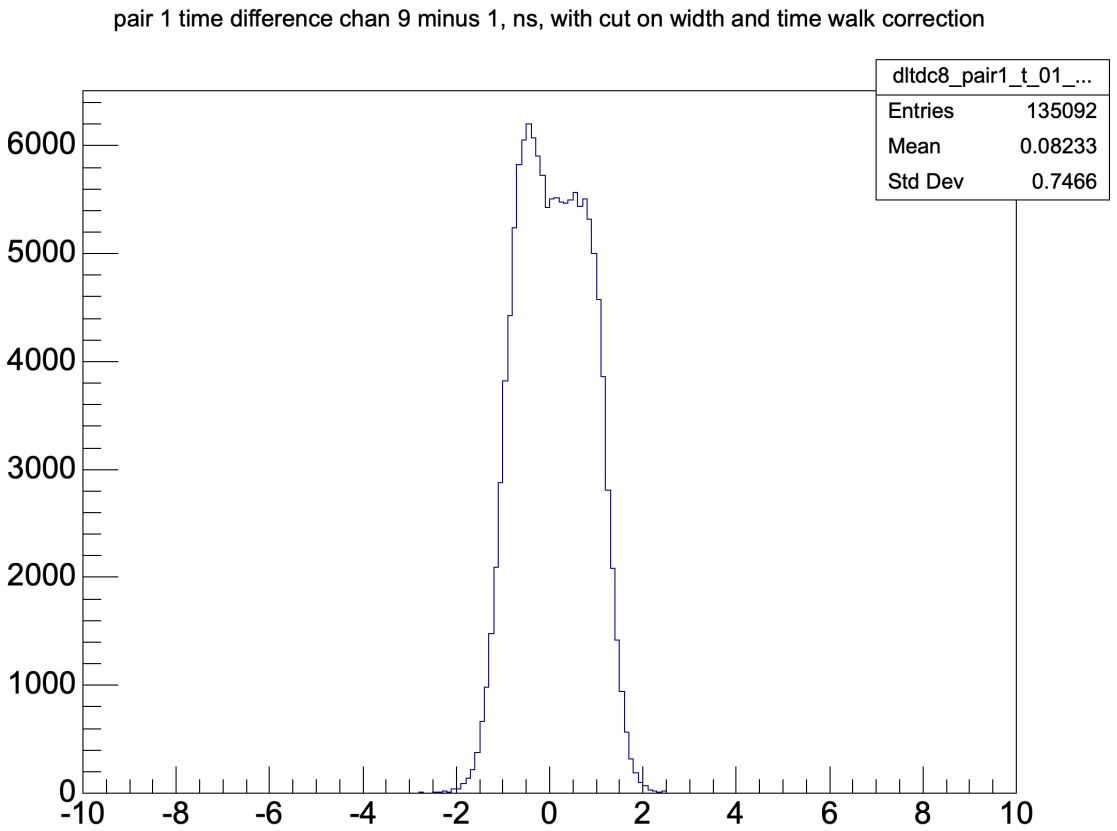
Equipment Status – Scintillator Quality



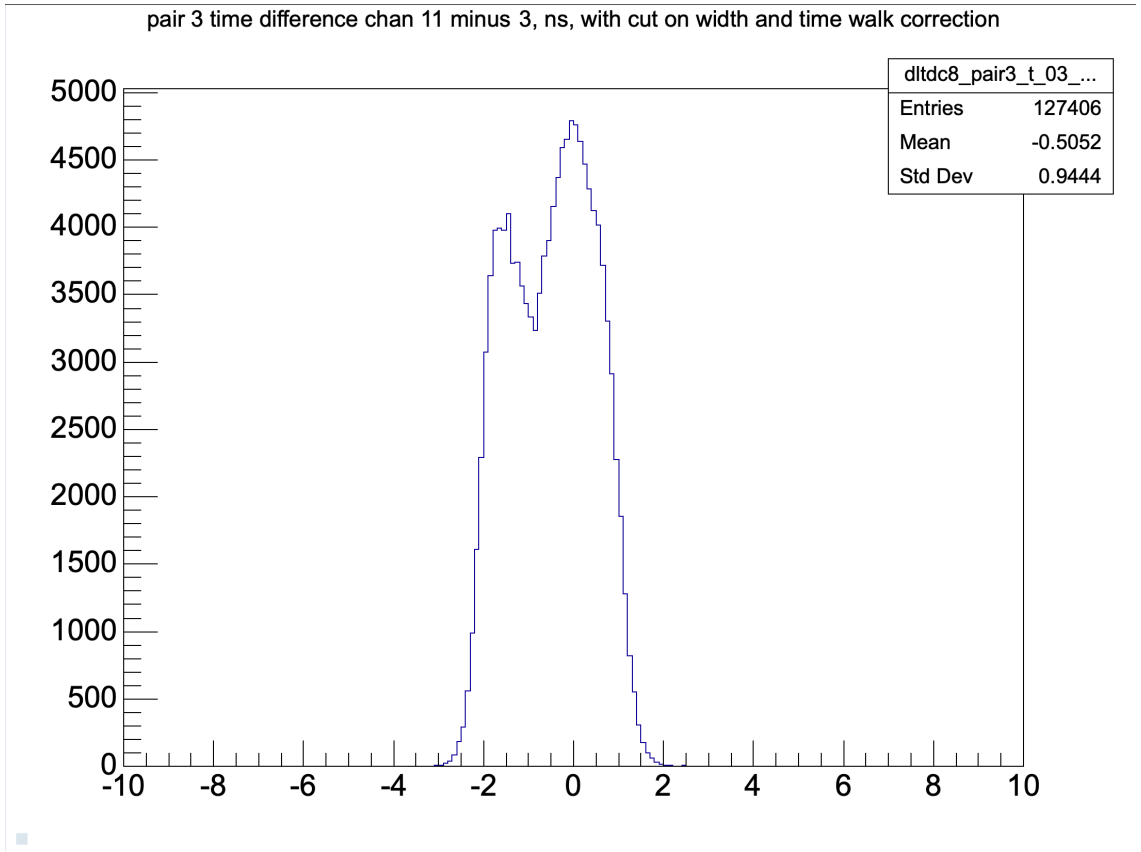


High crazing

Equipment Status – Scintillator Quality



Low crazing



High crazing

Equipment Status - Cables

- All detector cables are on site and ready
  - Waiting on approval for +/- 6 low voltage to have the power supply on the roof

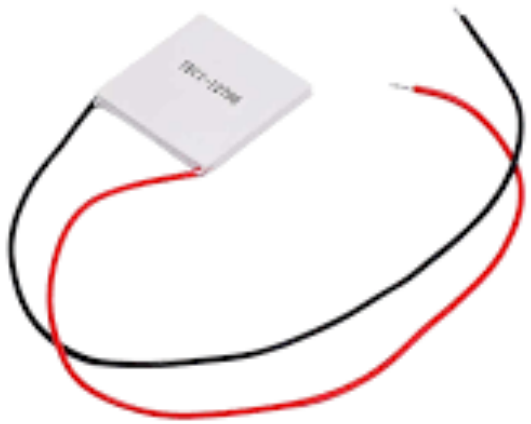
Delay Cause: Poor Silicone

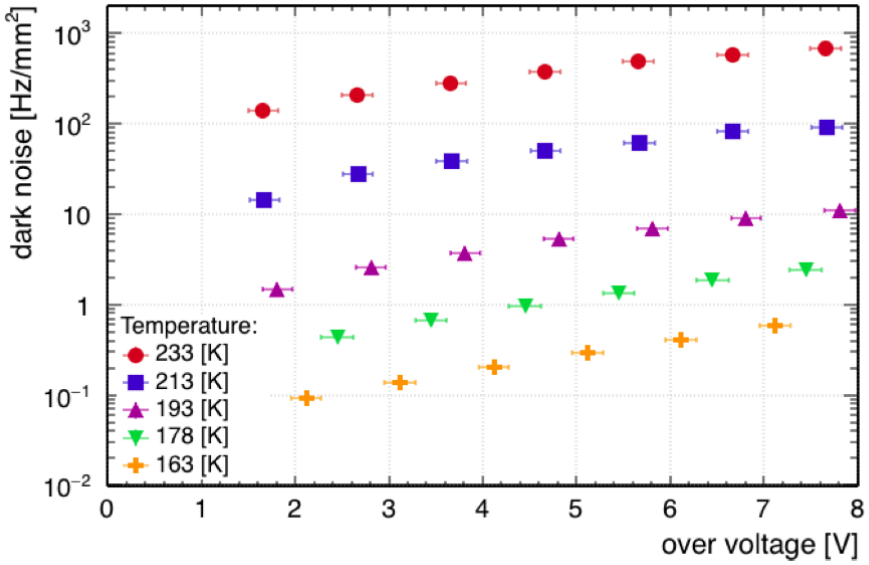
- ~April onwards we had problems with the silicone not curing completely
- Possible humidity dependence

Cooling system

Last time:

Peltier cooler discussions





Gallina, G., Giampa, P., et al, 2019. Characterization of the Hamamatsu VUV4 MPPCs for nEXO. https://arxiv.org/pdf/1903.03663

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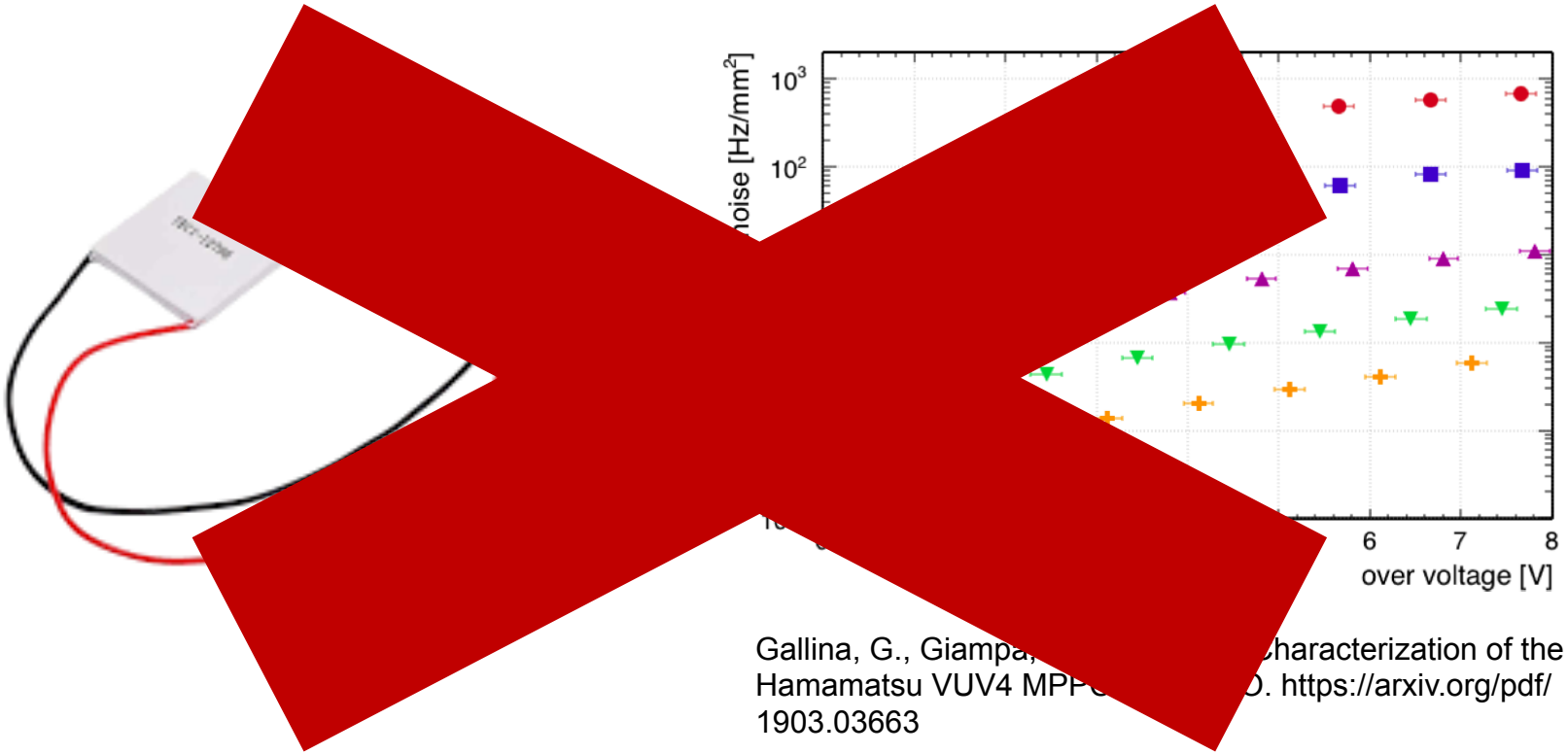
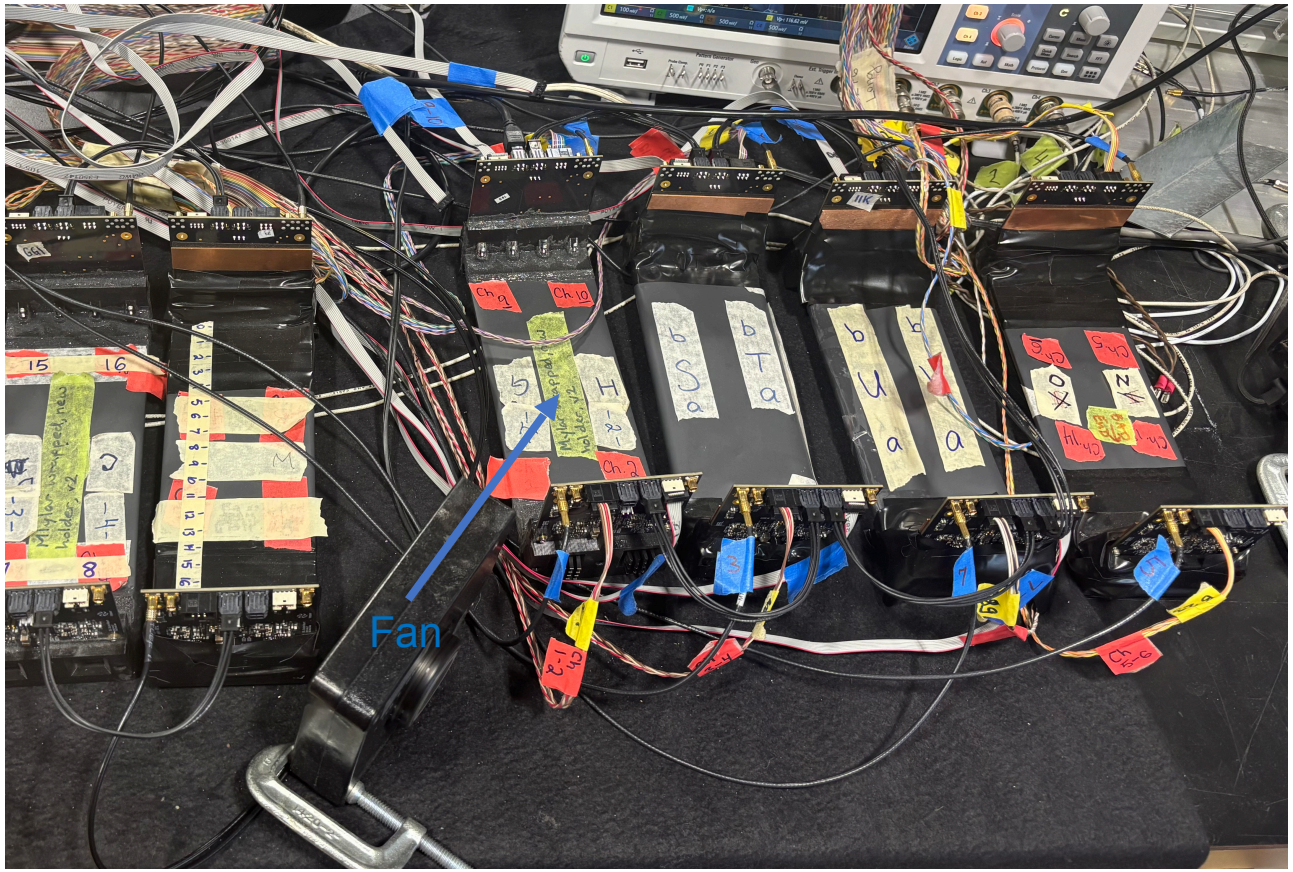


Gallina, G., Giampa[illegible] Characterization of the Hamamatsu VUV4 MPP[illegible]O. https://arxiv.org/pdf/1903.03663

Cooling System



Fan type, support system and arrangement to be decided

Next steps

- Finish efficiency studies and processing TOF data
- Complete program to enable easy coincidence analysis
- Couple with GEMs