

SBS Electron Calorimeter

Mark Jones

Many groups involved

SBS/ECal collaboration

JLab/UVa/YerPhi/SBU/JMU/NCCU

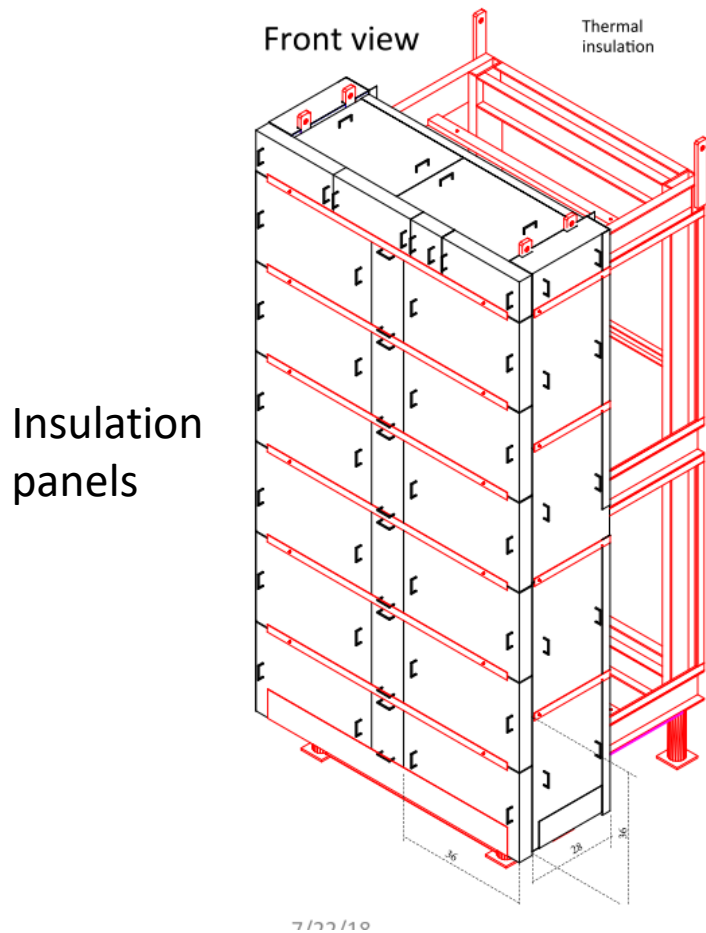
GlasgowU/UVa/NCAT/UConn/CMU/INFN

- ECAL was not funded in the SBS Project, so funding had to come from universities and Jlab Hall A operating budget.
- North Carolina Central University received a large grant for designing ECAL and building the ECAL oven.

SBS Electron Calorimeter

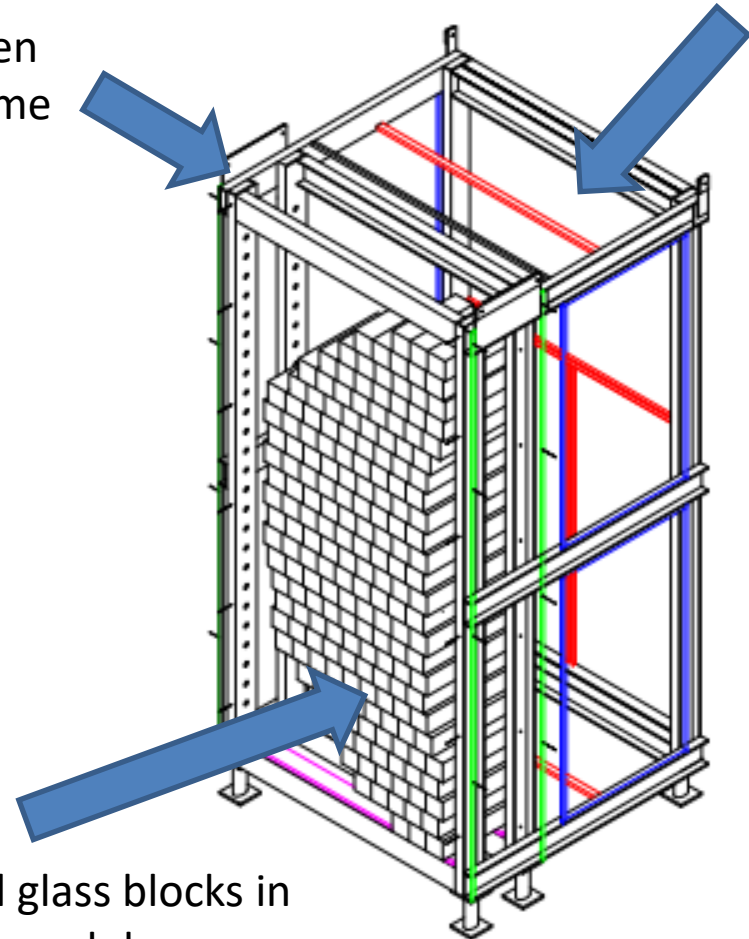
- Design by Yerevan, NCCU and JLab

PMT light box with
air distribution



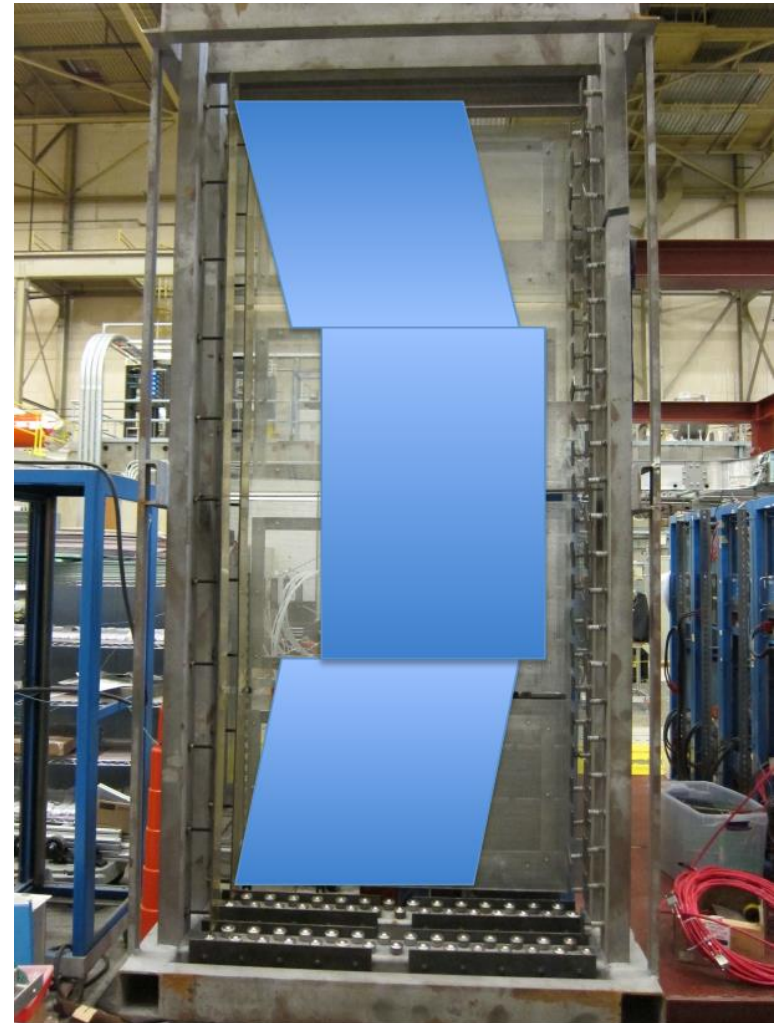
Oven
frame

1719 lead glass blocks in
191 supermodules

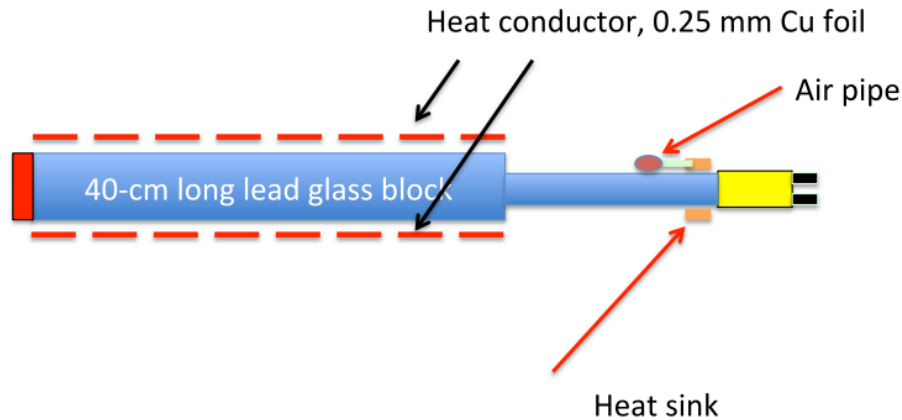


SBS Electron Calorimeter

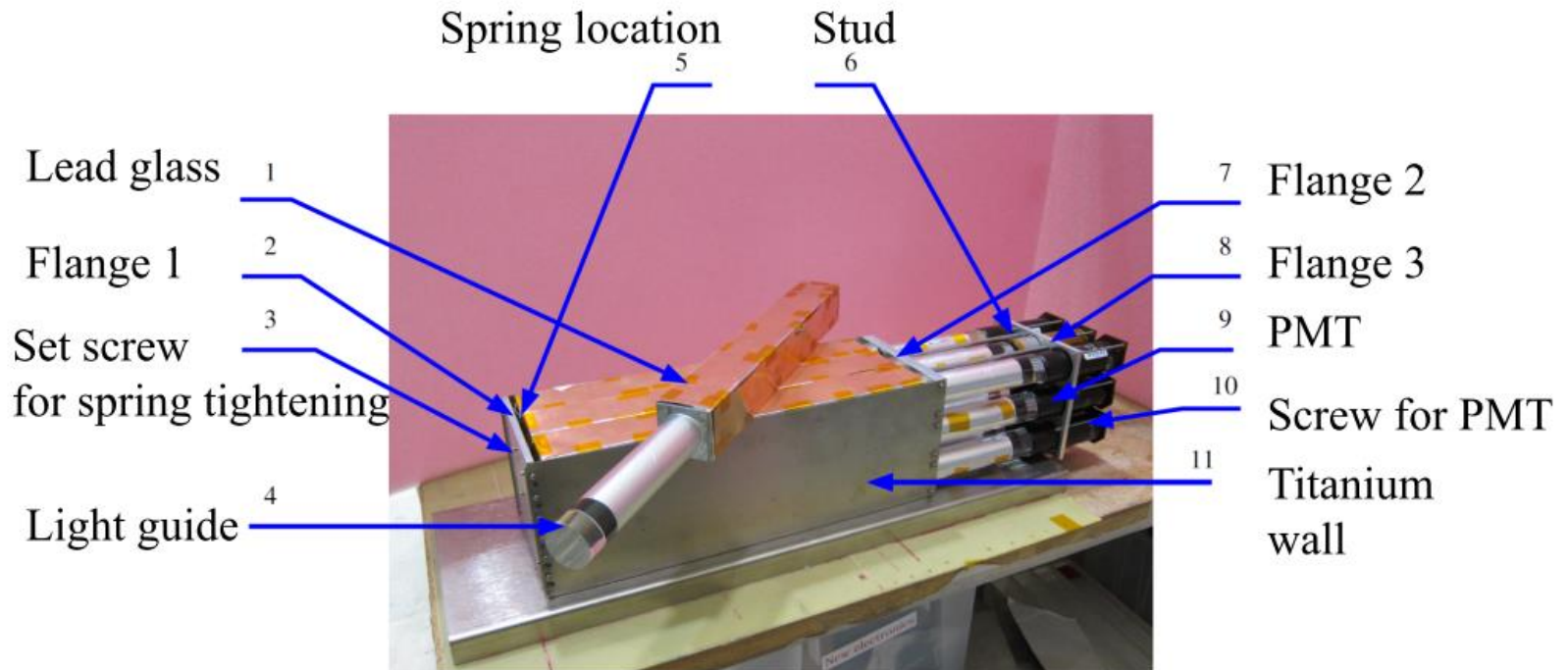
- NCCU purchased oven frame and arrived at Jlab summer 2018



SBS ECal Supermodules

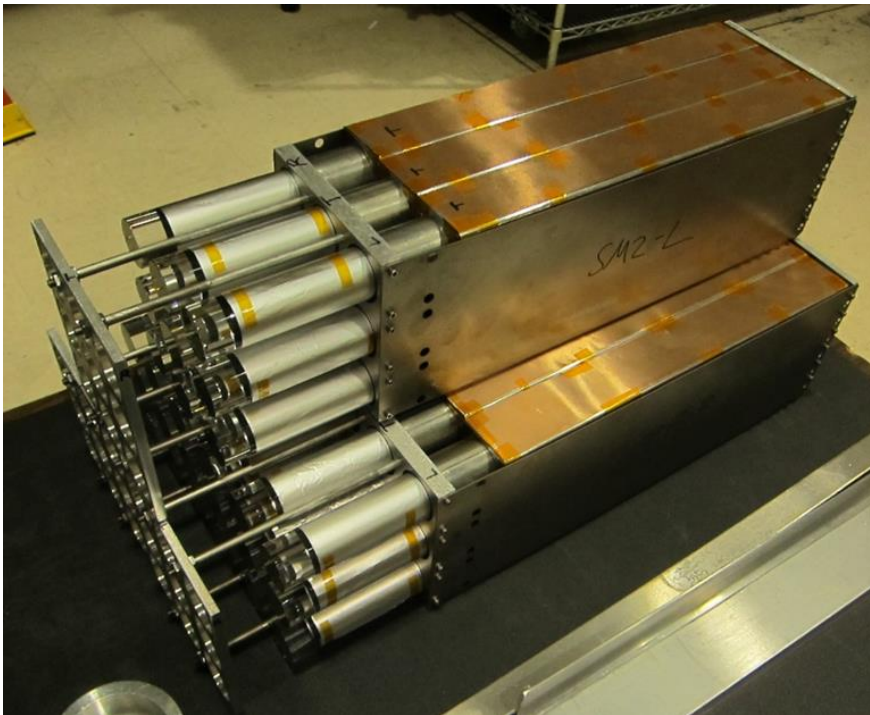


Extensive testing of design concept at Jlab and SBU



Work completed

- Completed assembly of supermodule frames and cutting of materials for wrapping by Feb 2019.
- 130 of out 191 supermodules have been assembled
- JLab Detector Support Group is contributing manpower to assembling supermodules.
- Need to finish gluing light guides to lead glass. Oven down for 1 year. Albert has glued 118 since arriving at Jlab.



Binh Ton (NCCU)

JMU work PMTs and bases

- PMT work
 - Completed testing of 2400+ PMTs by summer of 2018.
 - Measured relative QE, after pulsing, and gain vs HV curves for all PMT. [Report on work](#)
- Need to replace about 1000 Protvino style bases.
- Gabriel Niculescu and Ioana Niculescu at JMU have taken responsibility for new base design. Working with students: **Jorge Pena**, John Klug and James Dennis.
- Jorge Pena sent the final design of base by Feb 2020.

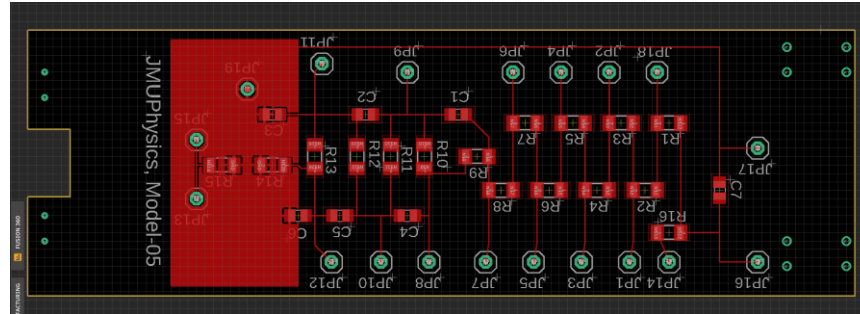
Salvaging parts from old bases

JMU students completed detaching the sockets and signal cables from the old bases.

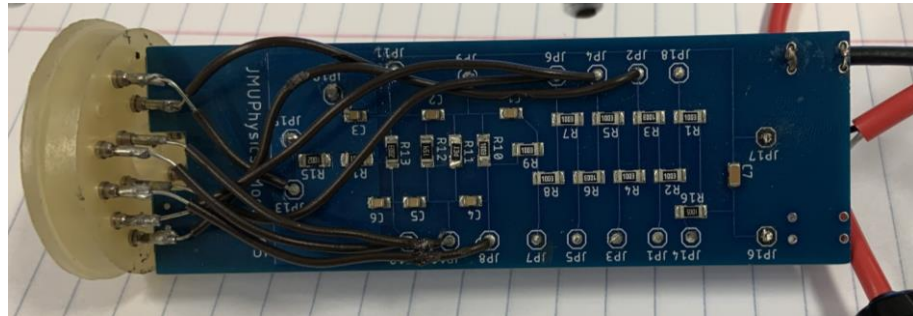


PMT base design

CAD design by Jorge Pena



Top view of the prototype base



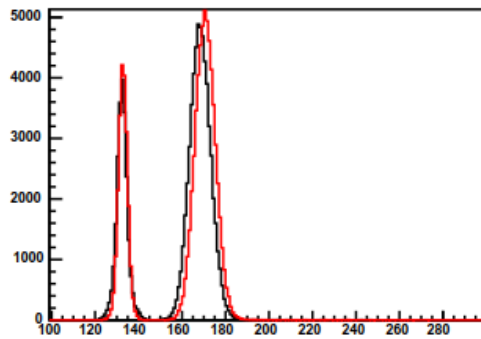
Bottom view of base



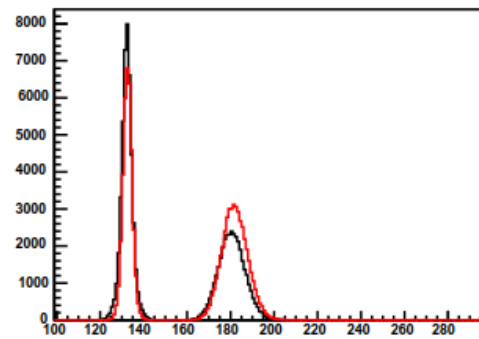
PMT base design

- Comparison between original bases (black) and new JMU base (red).
- Similar performance.

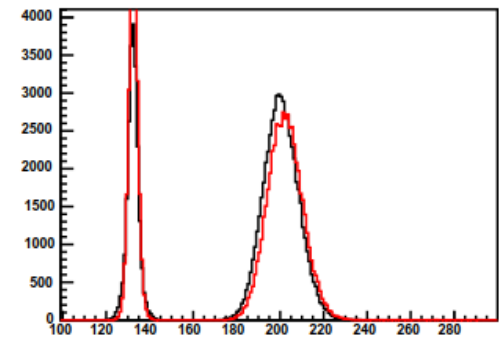
QDC ch= 5 High



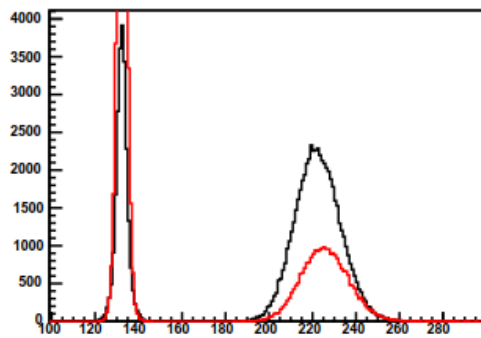
QDC ch= 5 High



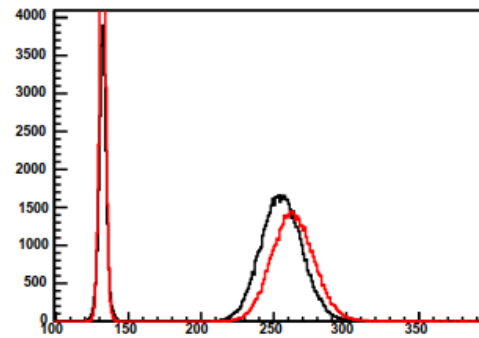
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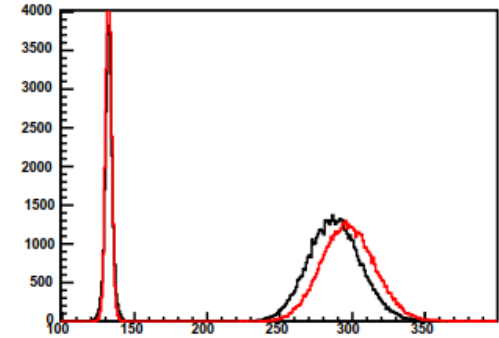
QDC ch= 5 High



QDC ch= 5 High



QDC ch= 5 High



Conclusion

- Completed assembly of supermodule frames and cutting of materials for wrapping by Feb 2019.
- Preparing test of system with a subset of supermodules in the TestLab.
- All PMTs have been tested by JMU and design of base is finalized.
- Albert Shahinyan is at Jlab working on Ecal projects.

Backup slide