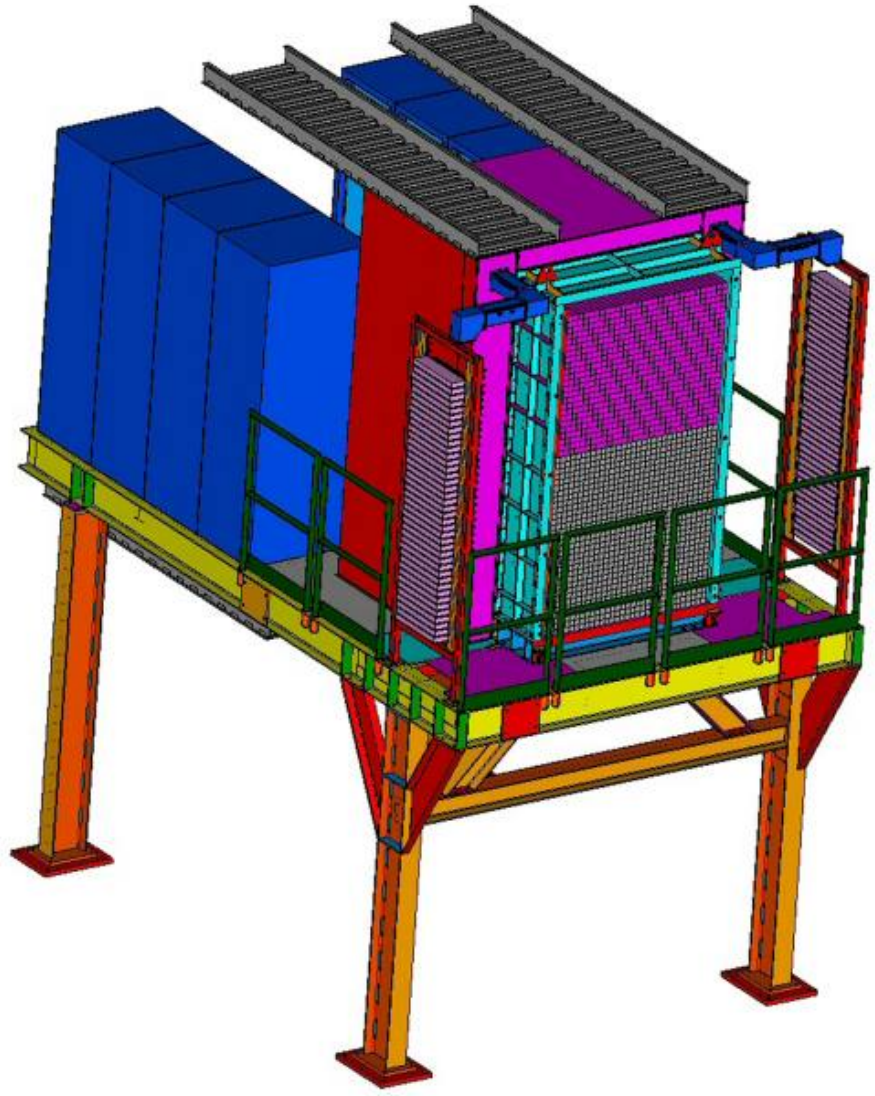
Update on BigCal

- Using cosmic ray trigger tested entire BigCal by Lubomir Pentchev, Yuri Melnik and Yuri Goncharenko.
- Yuri Matulenko wrote software for automatic gain matching of HV.
- In general, everything was fine.

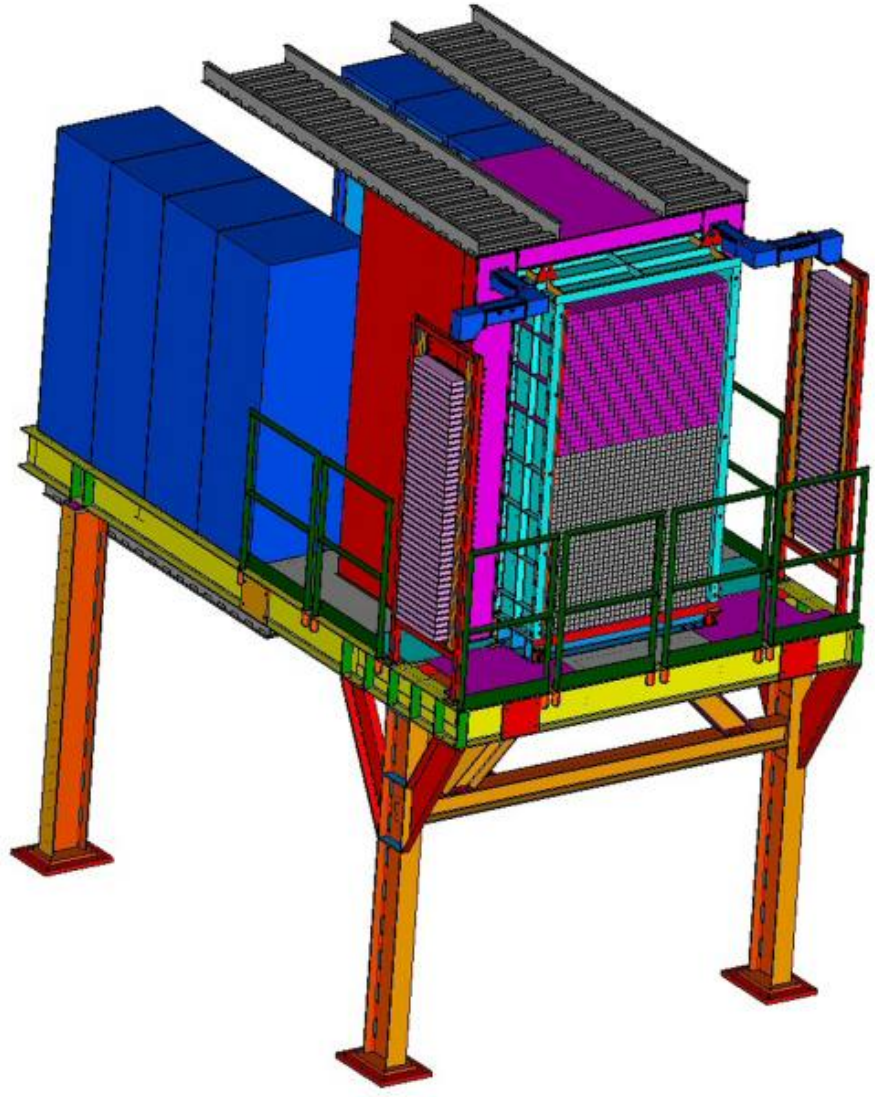


Update on BigCal

- But investigating found problems
  - The optical grease was darkening.

    Exposure to air
  - A slight 3mm bowing of the blocks

    Probably happened when lifting BigCal without aluminum plate in front
- Decide to unstack, clean and restack the glass.



Fixes

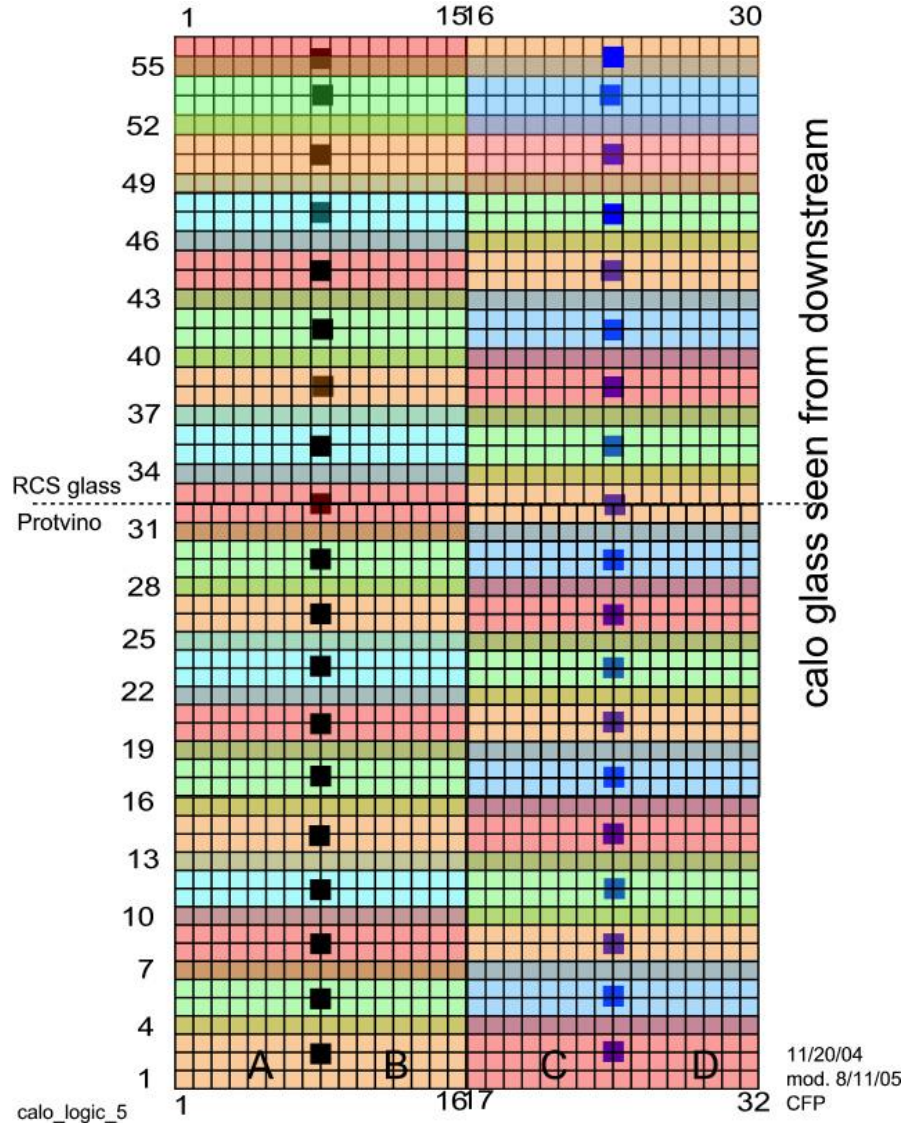
- Decide to drill 1744 0.5cm holes into the aluminum face plate and permanently attached. (*Thanks to Andrew Puckett and Arthur Mkrtchyan*)
- Instead of optical grease, use “cookies” as optical coupler.
  - 5mm thick “cookies” act as a cushion.
  - Easier to disassemble and reassemble for annealing
  - Lose about 20% of signal.

BigCal present status

- Hamlet and Razmik developed technique for making “cookies”. **Not trivial!**
- In the short time, Hamlet and Razmik made 1100 “cookies” and the Yuris reattached PMT for the Protvino part of BigCal before they left.
- This week cosmic ray tests have started on the Protvino part.
- Unfortunately with BigCal problems not able to start with gain monitoring system.
- Now plan to start working on gain monitoring system.

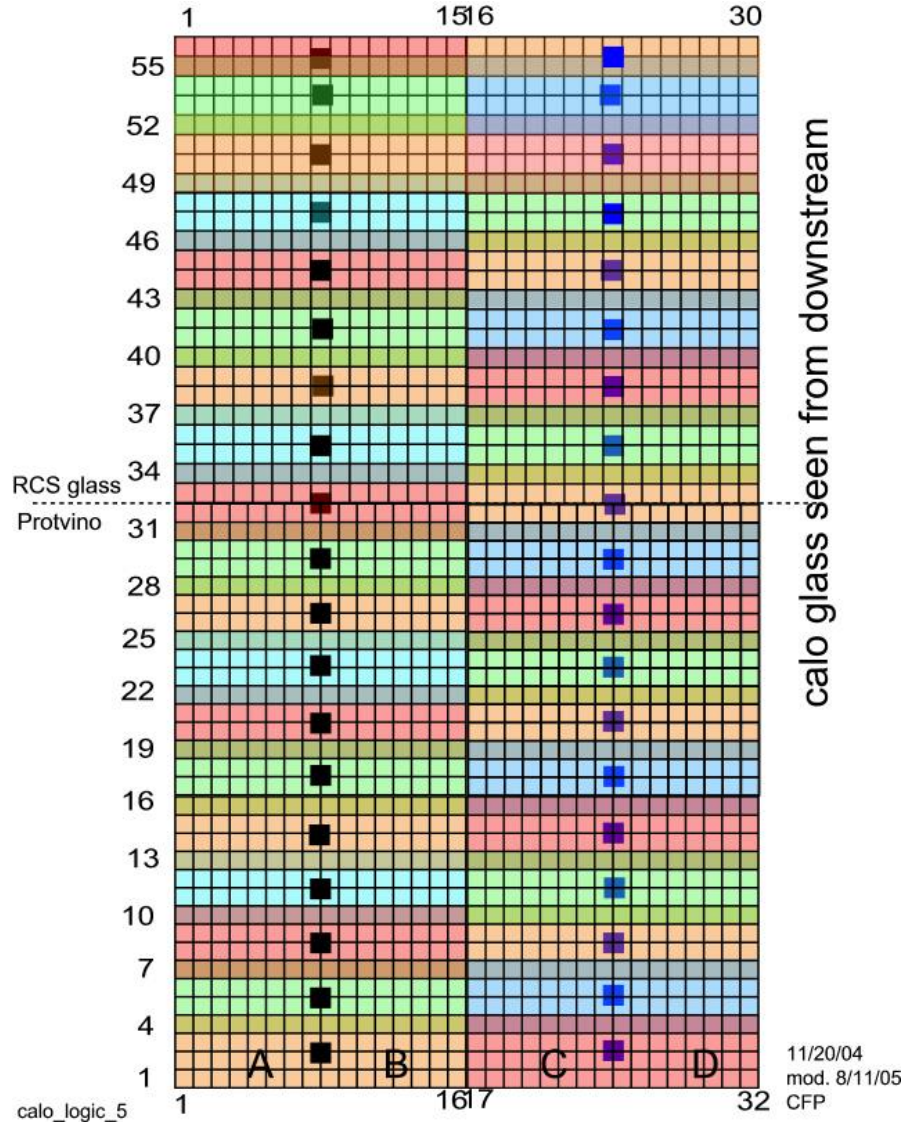
Gep-3 trigger

- Each PM signal goes to input of a first summing module.
  - A summing module takes 8 inputs and produces eight individual output signals (5x larger) for ADC and 6 summed outputs.
  - Need 224 first summing modules.



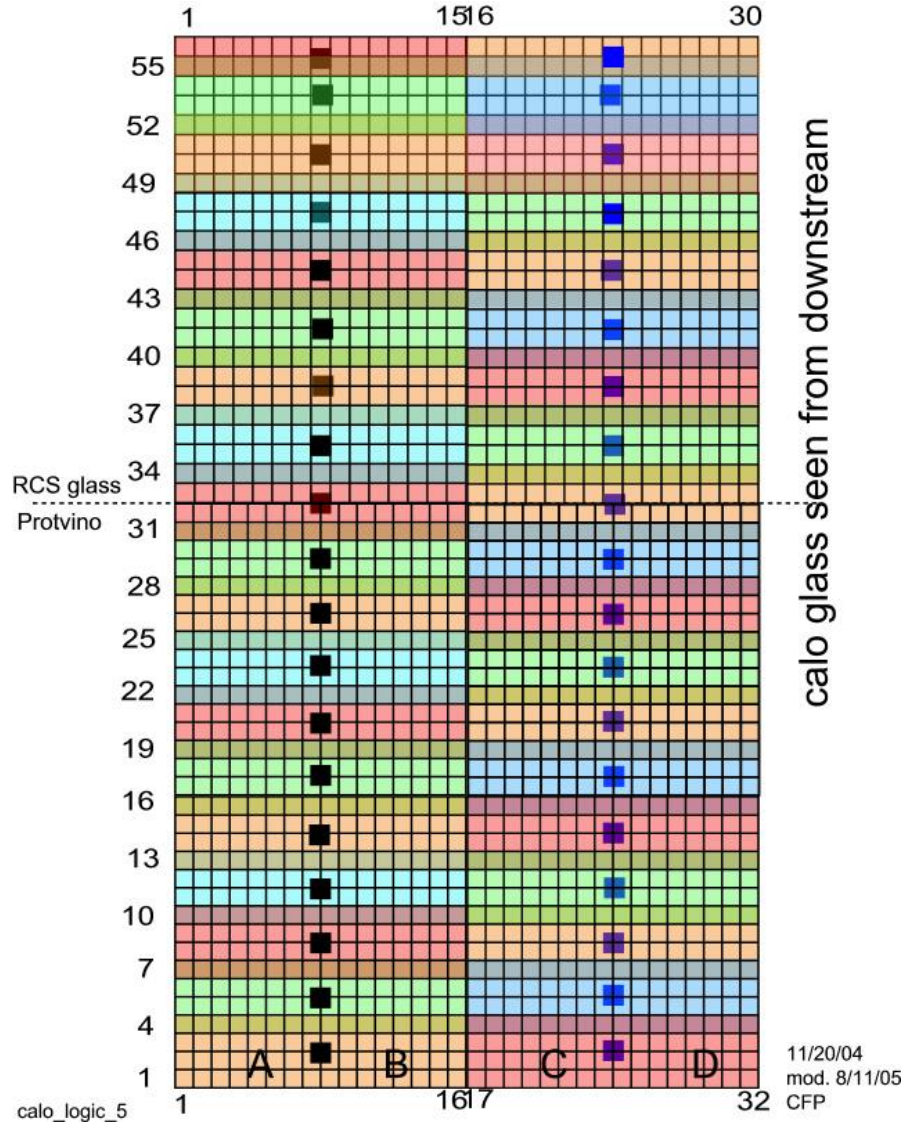
Gep-3 trigger

- Then 8 outputs from first summing module are put into a 2nd summing module (With only gain of 1x) .
  - Each 2nd summing module is sum of 64 signals.
  - Every 4th row is placed in two of the 2nd summing modules
  - Need 38 2nd summing modules.



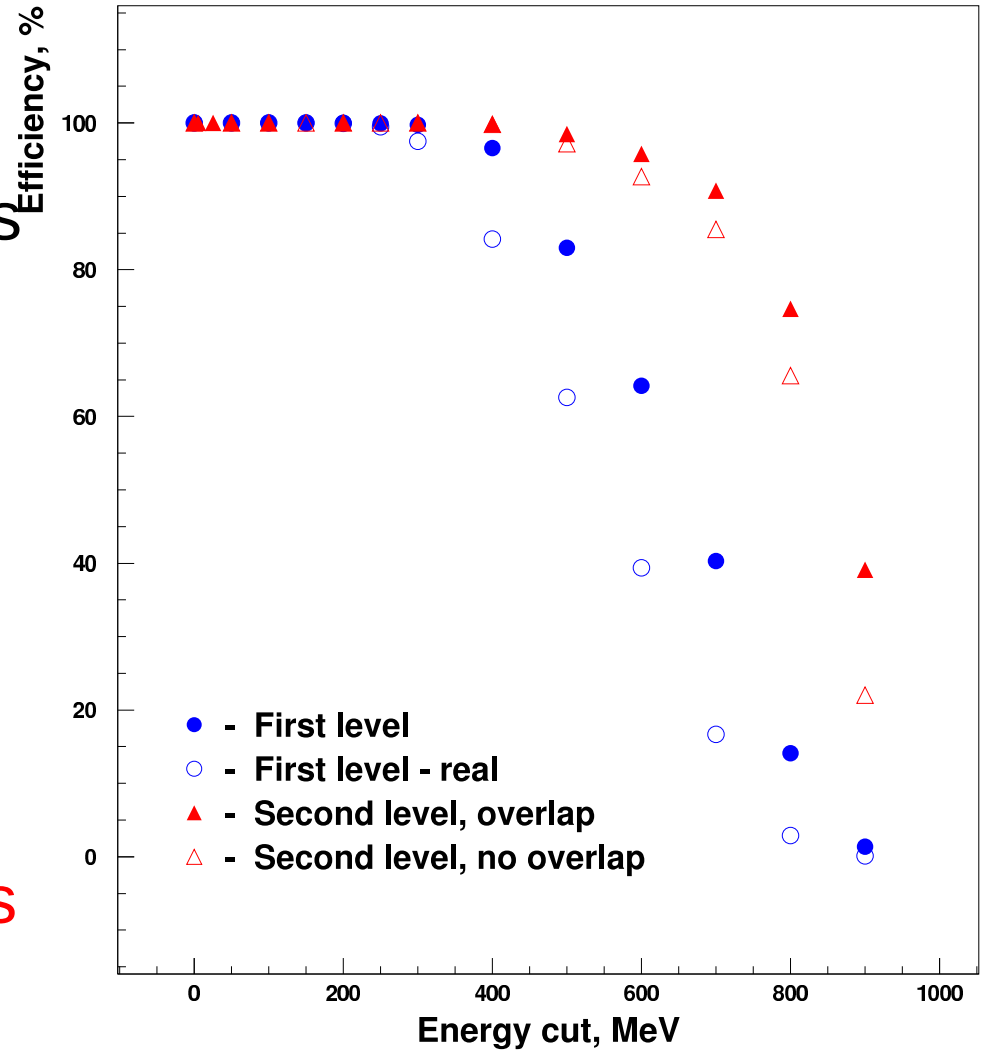
Gep-3 trigger

- Output from 2nd summing module sent to a discriminator.
- Trigger is OR of discriminator outputs.
- 38 2nd summing modules, discriminators and associated electronics are needed for Gep-3.
- Charles Perdrisat is looking into purchasing.



Trigger tests in Monte Carlo

- Vladimir Kravtsov (IHEP) used MC to study different triggers
- MC used 1 GeV electrons on 32x32 Protvino lead glass blocks (50K events)
  - 1st level: 128 groups of 8 blocks
  - 2nd level : with 20 overlapping groups of 4x16 blocks
  - 2nd level : with 16 nonlapping groups of 4x16 blocks



Trigger and background

- Andrew Puckett is investigating expected trigger rate for different discriminator thresholds.
  - Uses Pavel's code to generate particles in BigCal.
  - Uses IHEP code to simulate the particles in BigCal and the trigger.
- For SANE, have Pavel's code to generate particles into BETA. Need to interface results into IHEP code to look at background trigger rates.