

05.02.2020



Calorimeter Status

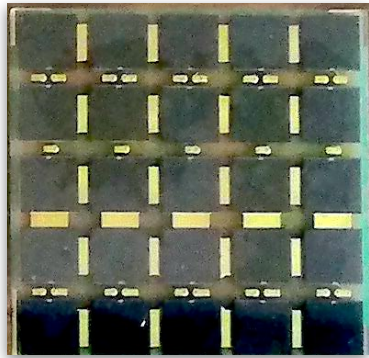
Physics meeting

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Mignone, L. Ramello, L. Scavarda

Test Beam - 10/2019



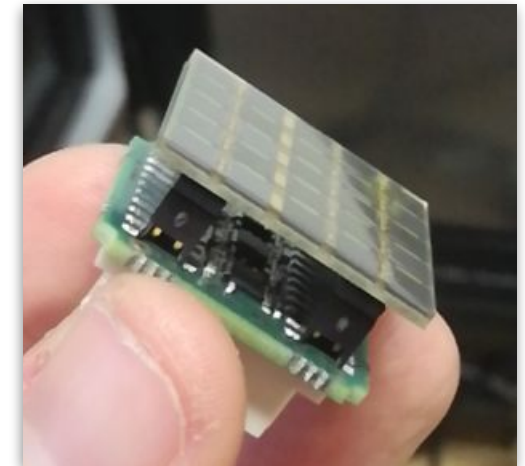
25 SiPM arrays
4x4mm² (15 μm)



- 1 Module
- 9 Crystals
- 3 wrappings:
 - 4 Tyvek
 - 3 Mylar
 - 2 WhitePainting



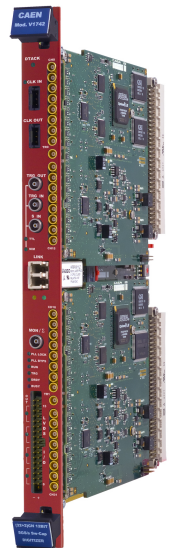
ReadOut Board



V1740



V1742



- First night:
 - Energy scan in cry 2,4,5,6,8. Angle between module and beam: 0°
 - Energy scan with module rotated by 30°
- Second night:
 - Energy scan with module rotated by 45°
 - Energy scan with module rotated by 15°
 - Energy scan with module rotated by 15° + digitizer V1742
 - Energy scan on single crystal (WhiteP, Tyvek, Mylar) + digitiser 1742

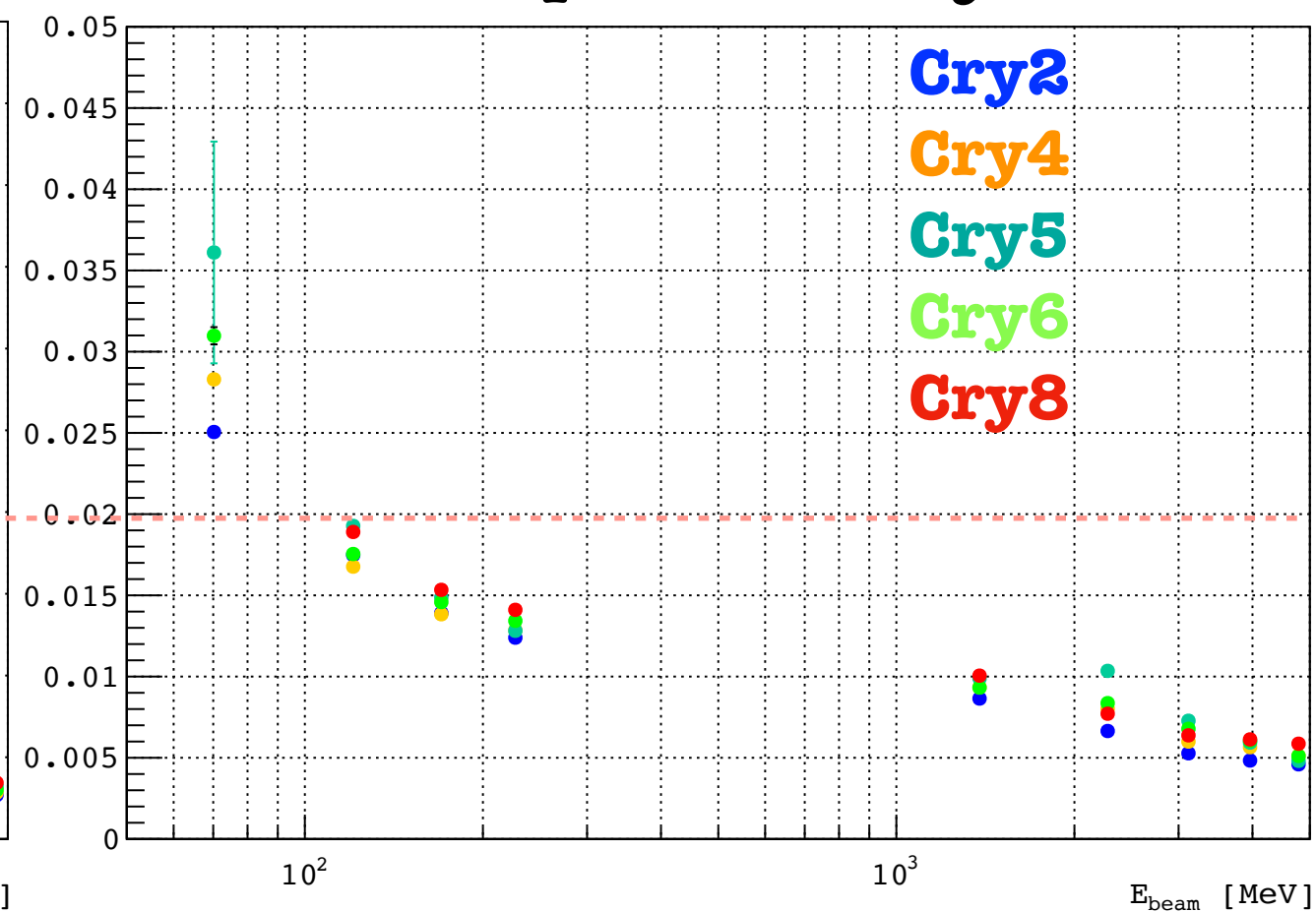
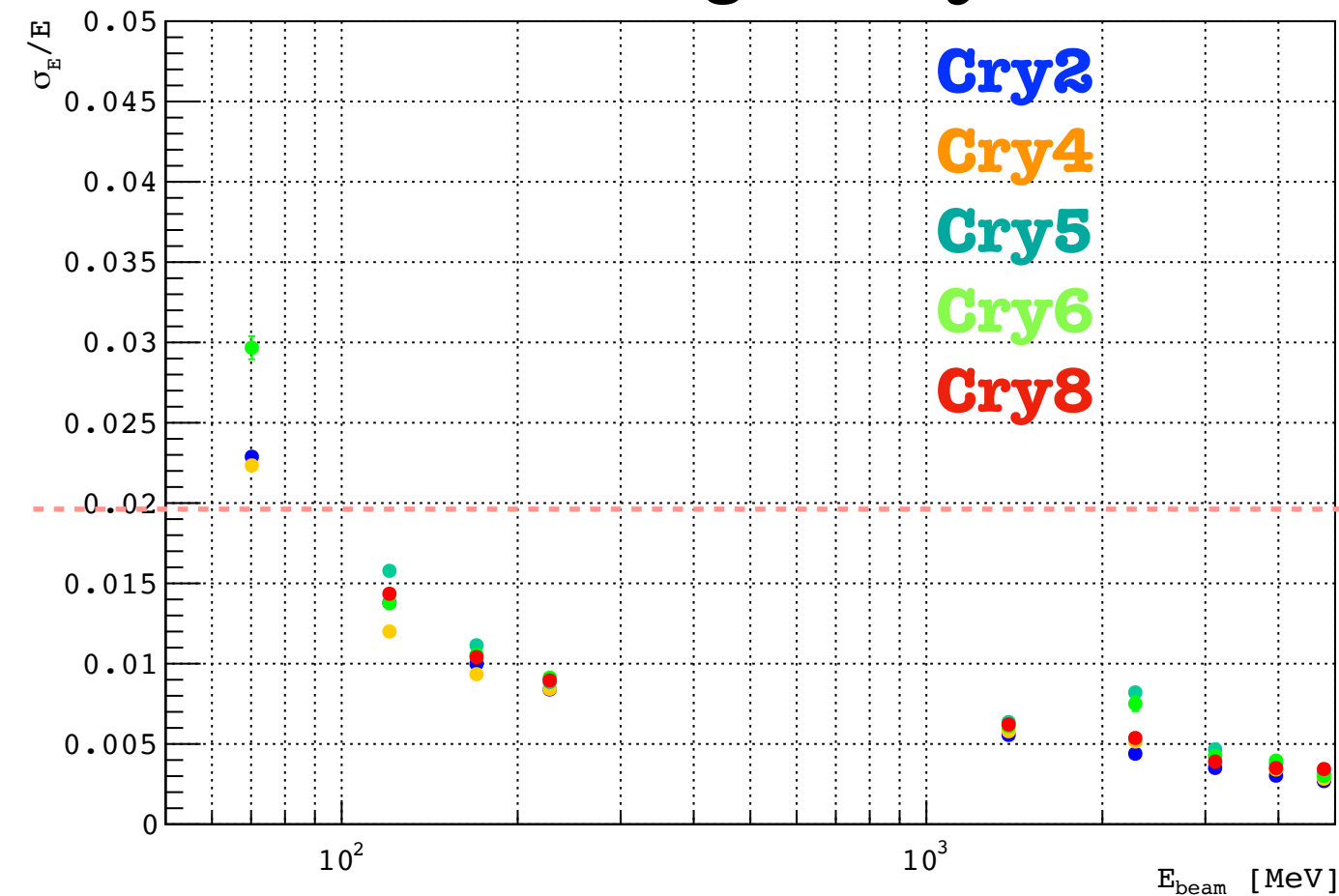
Energy Resolution - 10/2019



| | | |
|------------|--------------------|------------|
| 1 | WhitePainting 2 | 3 |
| Tyvek 4 | Tyvek 5 | Tyvek 6 |
| 7 | Mylar 8 | 9 |

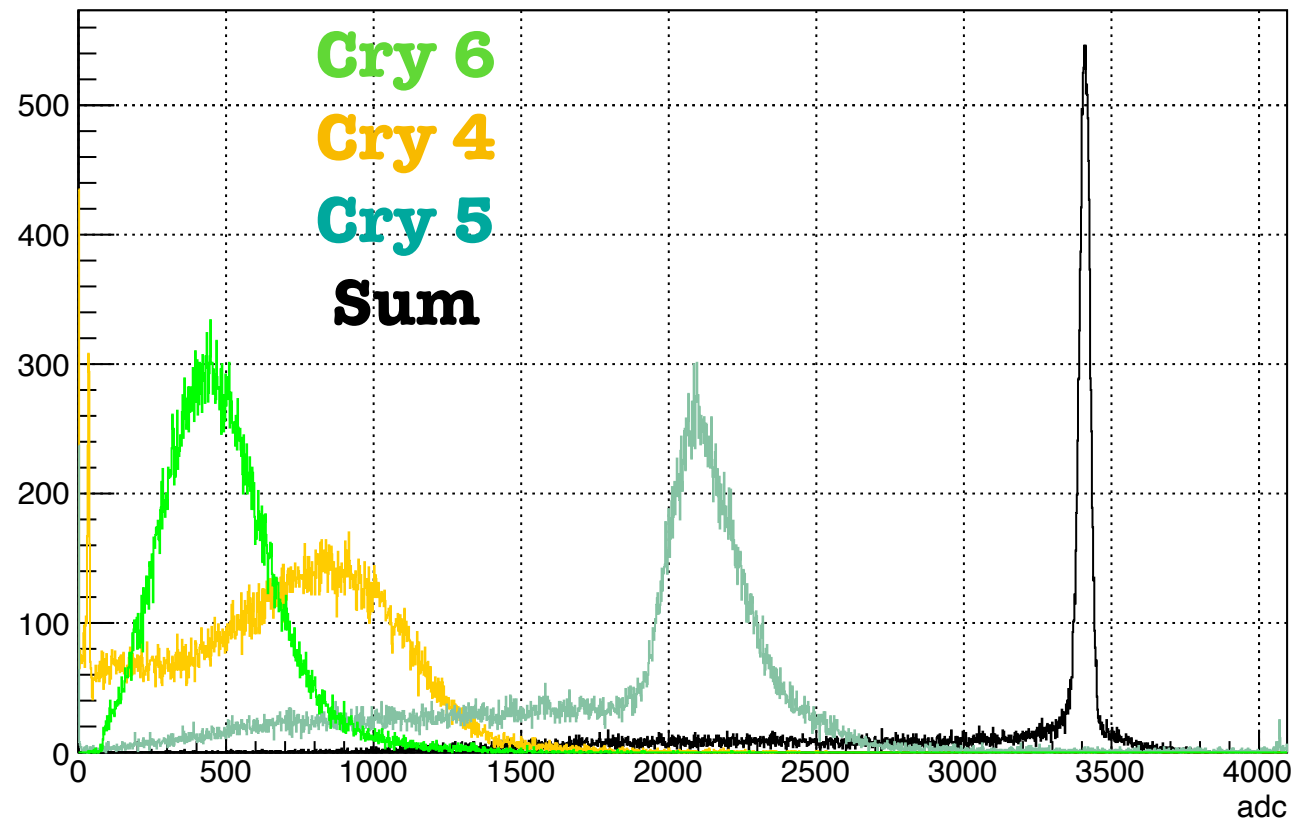
Charge Analysis

Amplitude Analysis

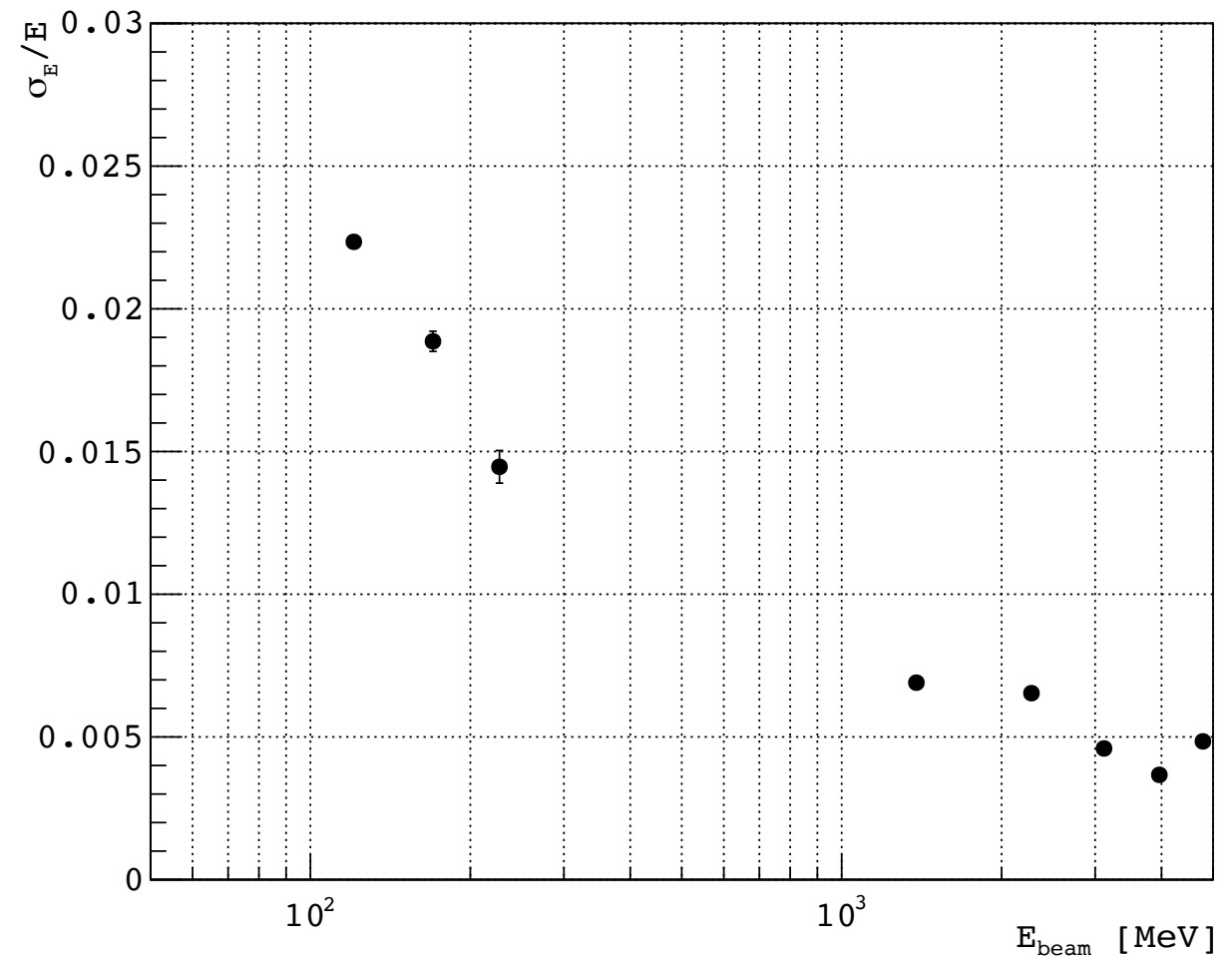


- Energy resolution below 2.5% for all crystals both for carbon and proton
- Too much pileup with 70 MeV proton (in particular with cry 5-6-8), untrusted points

Energy Resolution 30° - 10/2019



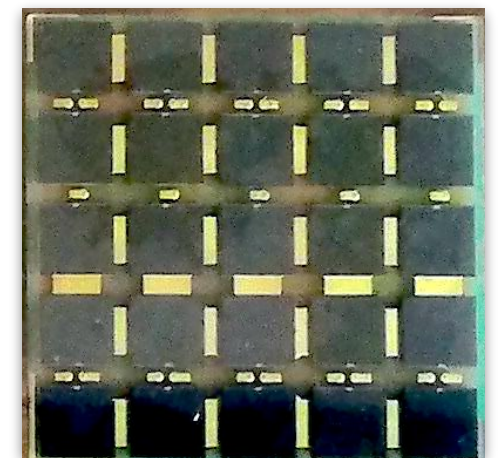
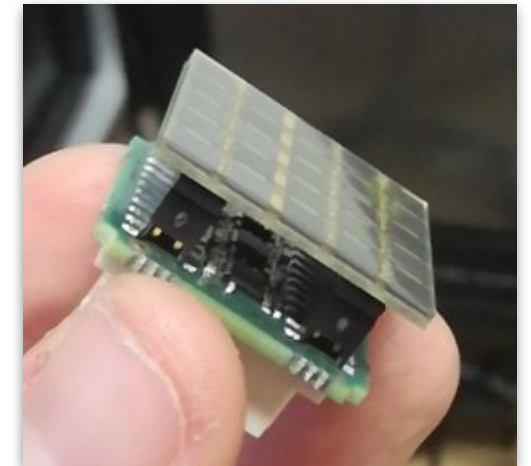
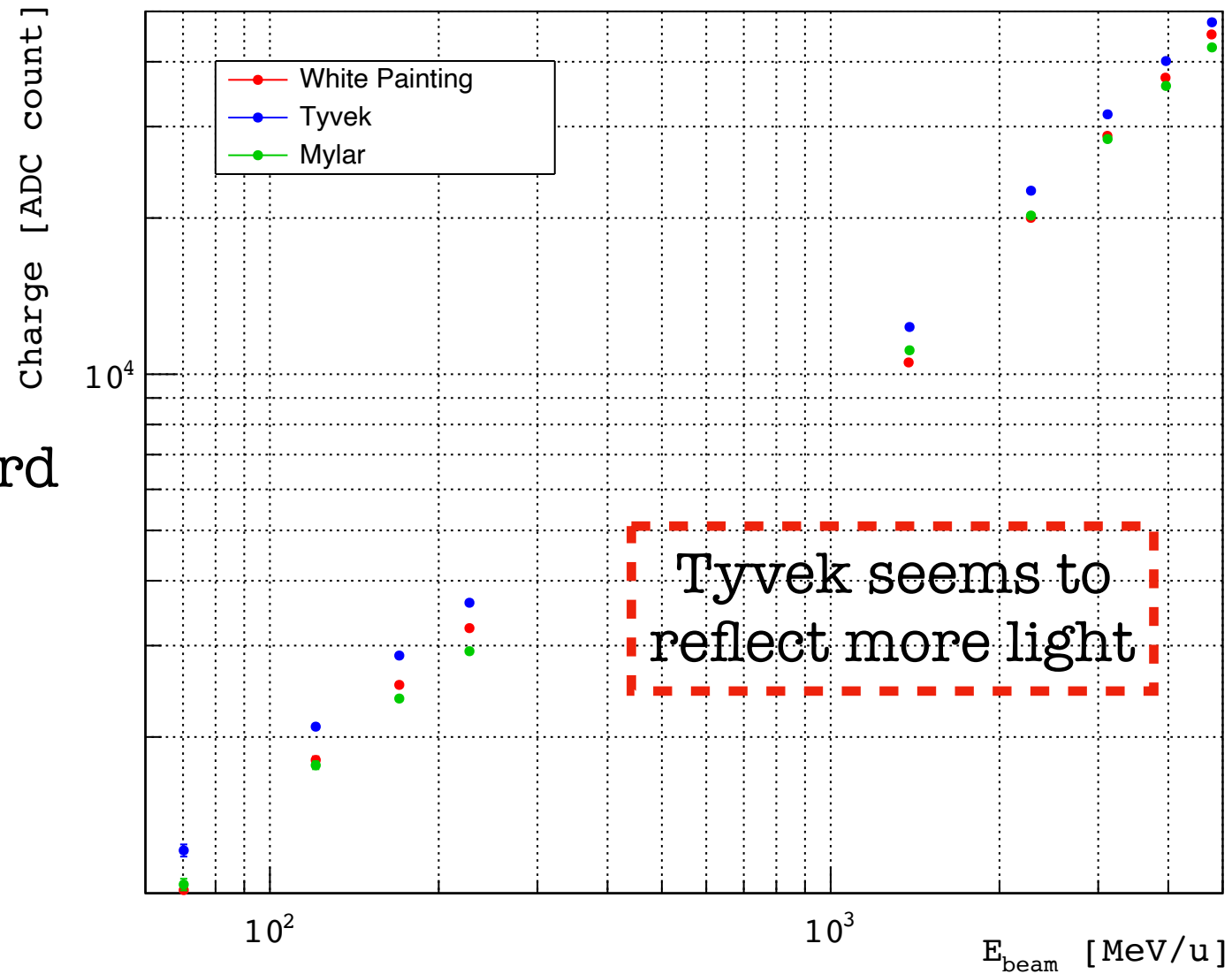
Energy resolutions $< 2.5\%$
summing the light released in the 3
crystals.



Summary



- SiPM
- Readout board
- Wrapping
- Mechanics
- Digitizer



What do we still have to decide?

V1740
(low frequency)



12 bits
62.5 MHz
192 s in $3\mu\text{s}$
2V
64 channels

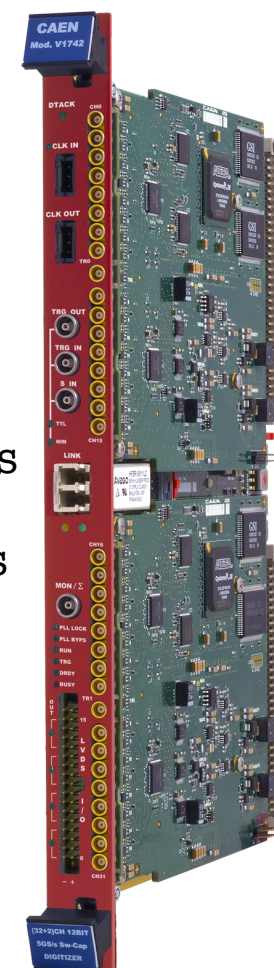
Pulse shape
Analysis

Dynamic Range

Money

Amount of Data

V1742
(high frequency)



12 bits
1 GHz
1024 s in $1\mu\text{s}$
1V
32 channels



- Test of the calorimeter module (parallel with the beam line and rotated)
- Some improvements from last TB:
 - SiPM glued with BGO
 - better cover for BGO to avoid the lack of light from the back of crystals
- reading of temperature sensor