DAQ requirements for the ZDC

Far-Forward and IR Integration YR meeting

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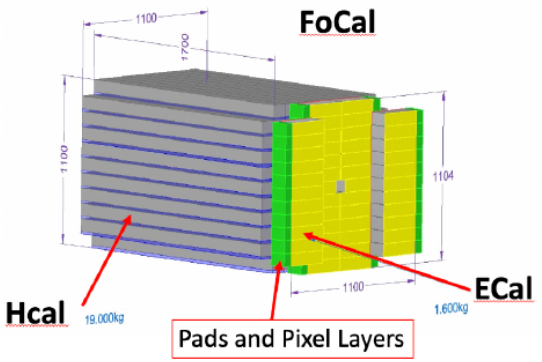
Yuji Goto (RIKEN)

ALICE FoCal

FoCal - main components 3



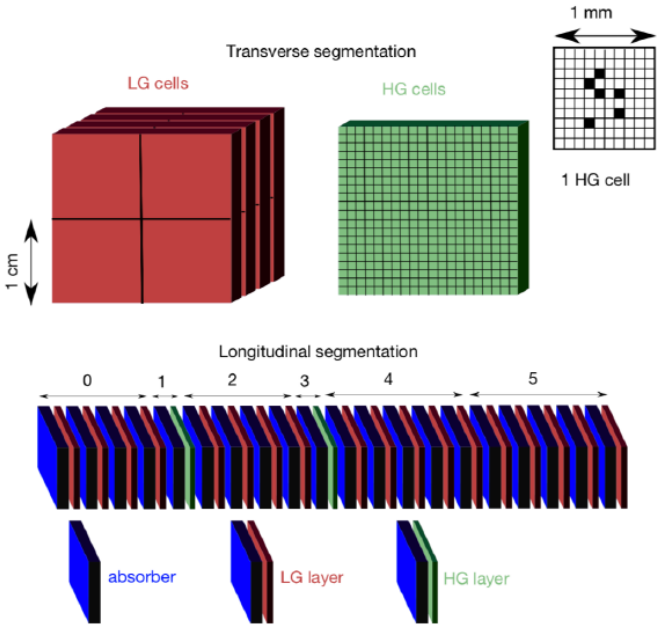
Pads

1 layer = 5 towers design, and silicon sensor (8 x 9 cells)

1) Total number of modules: 11 x 2 = 22 modules
2) Total number of Pad layers: 22 x 18 = 396 layers
3) Total number of towers : 22 x 5 = 110 towers
4) Total number of silicon sensors: 396 x 5 = 1,980 sensors
5) Total number of readout ch.: (8 x 9) x 1,980 = 142,560 ch

+396 FEE PCB, 180 aggregator boards, 8 CRU

HCal: ~2K channels



FoCal HG layer

- **1980 ALPIDEs**
- **132 staves**
- **612 links (324 IB/OB + 288 OB)**
- **6 IB/OB modules (6 * 6 = 36 IB/OB staves) -> 36 RUs**
- **16 OB modules (16 * 6 = 96 staves) -> 16 RUs**

+132 Flex PCB, 52 RU, 22 TB, 5 CRU

x2 for two pixel layers

EIC-ZDC EM calorimeter

- Approx. lateral tower size: 10cm x 10cm
  - 36 towers for 60cm x 60cm lateral coverage
- Pad layers: 18 layers
  - Approx. pad size: 1cm x 1cm
  - 100 channels x 18 layers / tower
  - 100 x 18 x 36 towers = 64,800 readout channels
- Pixel layers: 2 layers
  - ALPIDE (MAPS for ALICE ITS upgrade)
  - Approx. chip size: 3cm x 1.5 cm
  - 1024 x 512 pixels / chip
  - 20 x 40 x 2 layers = 1600 chips
  - Continuous readout
    - Read out only hit information, depending on occupancy
    - No occupancy evaluation yet

EIC-ZDC hadron calorimeter

- No decided design (or technology) yet
- Assuming similar technology to the EM calorimeter (sandwich) with 10 additional pad layers
  - 100 x 10 x 36 = 36,000 readout channels
- Possible additional sampling layers, but negligible number of readout channels