Status Report

Crystals
SiPMs
Readout
DAQ
Mechanics
Plans

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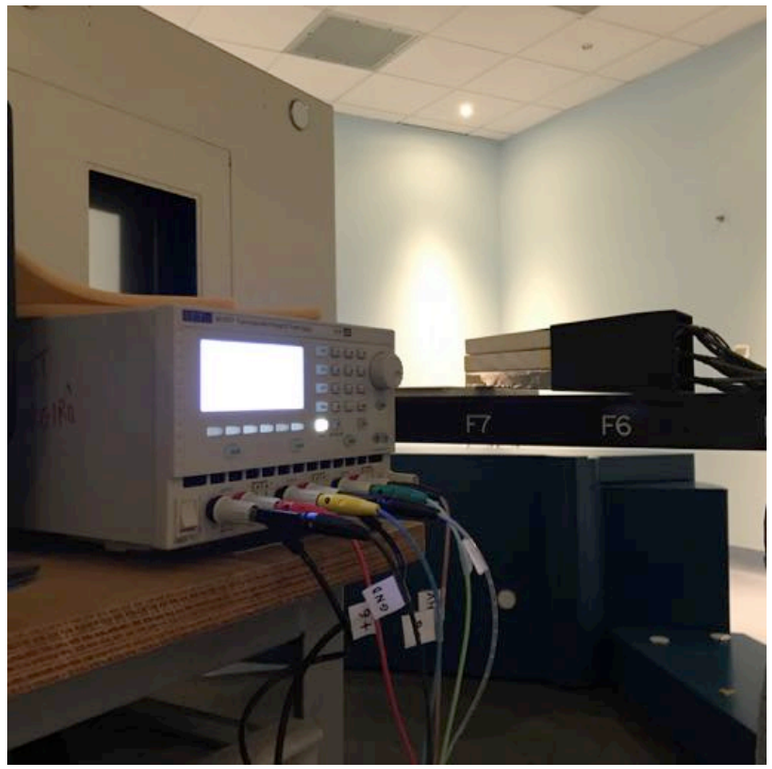
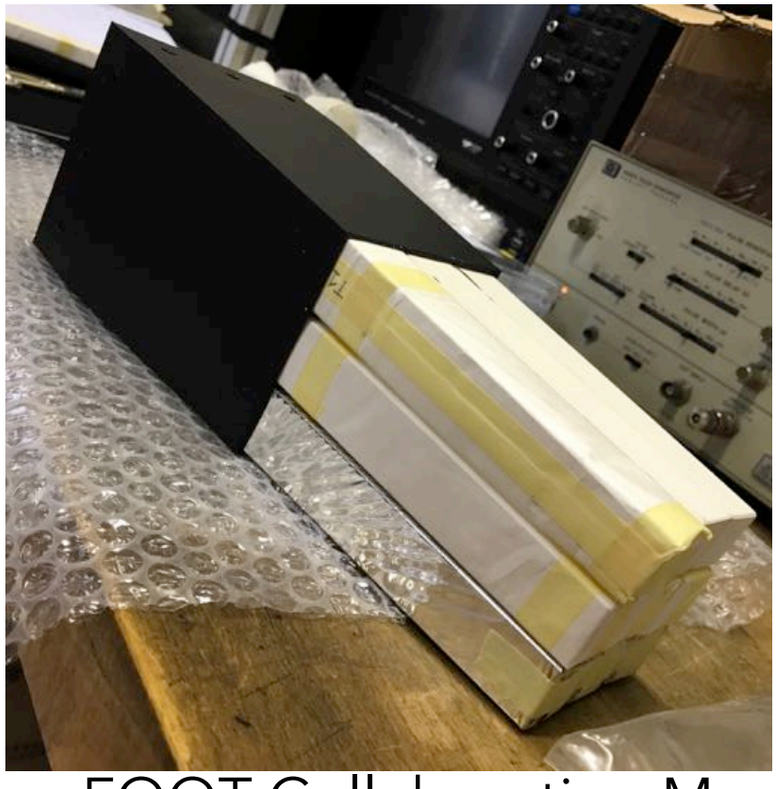
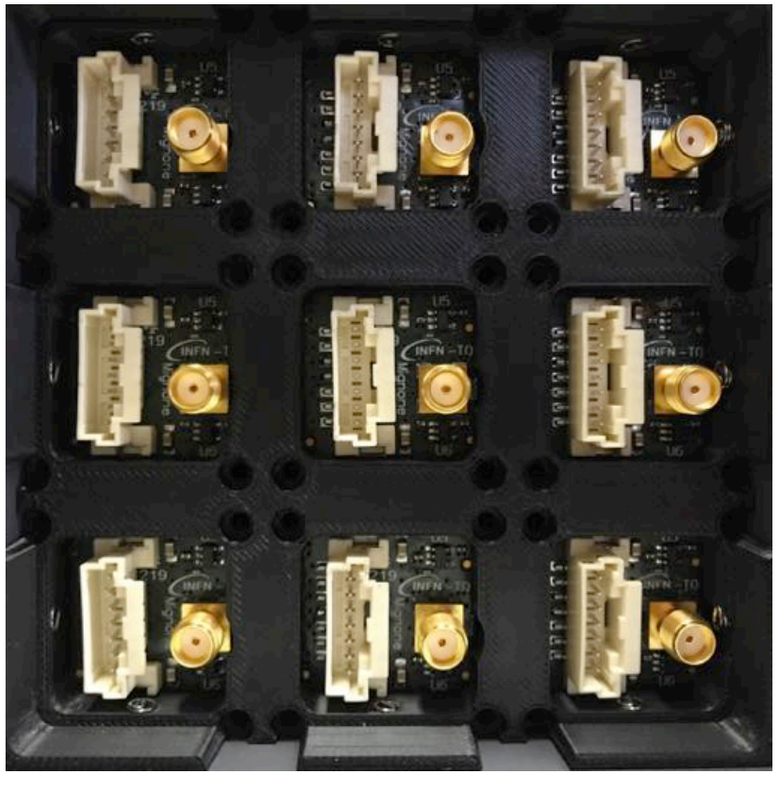
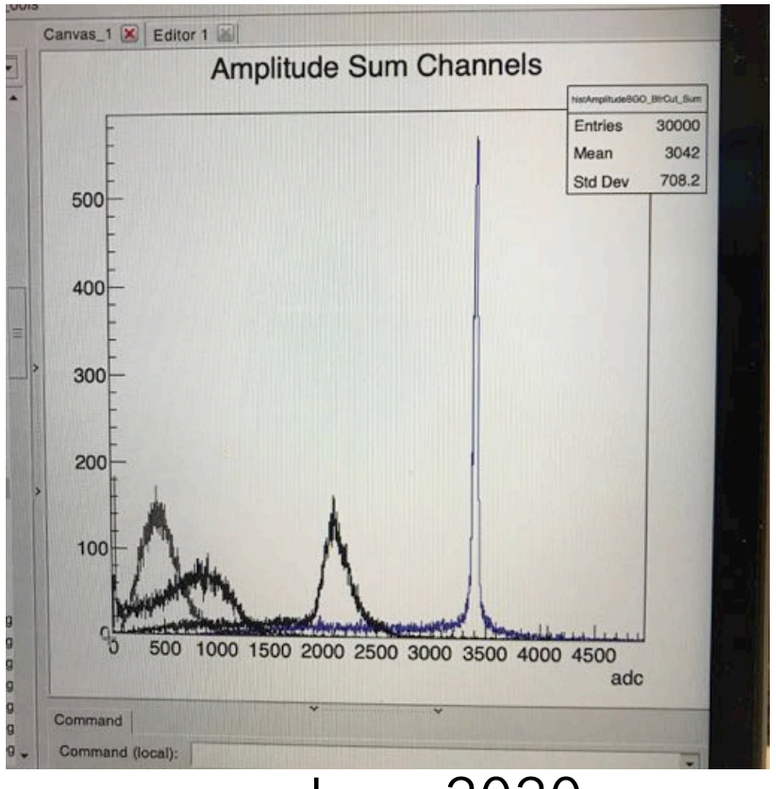
February 2020 Module test @ CNAO









BGO crystals

- **Crystal size mapping: completed**
- **Crystal painting vs. wrapping, coupling**
  - **TYVEK wrapping**
  - **SiPM coupling: tested in Feb2020**
- **2020 Plan**

✓ **Crystals wrapping and coupling at CERN, hopefully starting in September**

SiPM tiles: to do list

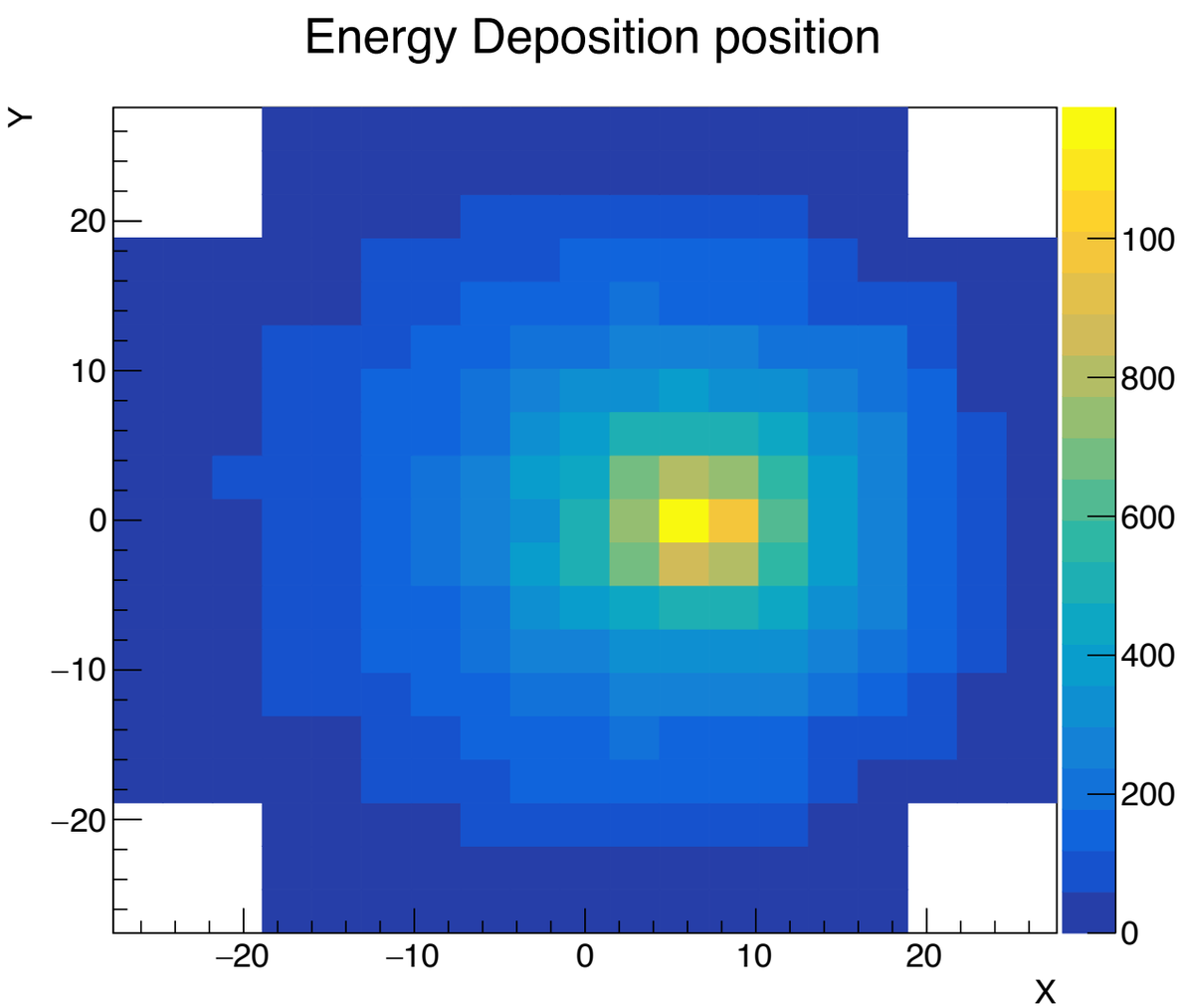
- **Order for production and packaging placed**
- **Silicon production resumed after COVID19 stop**
- **Tile delivery planned to start in September 2020**

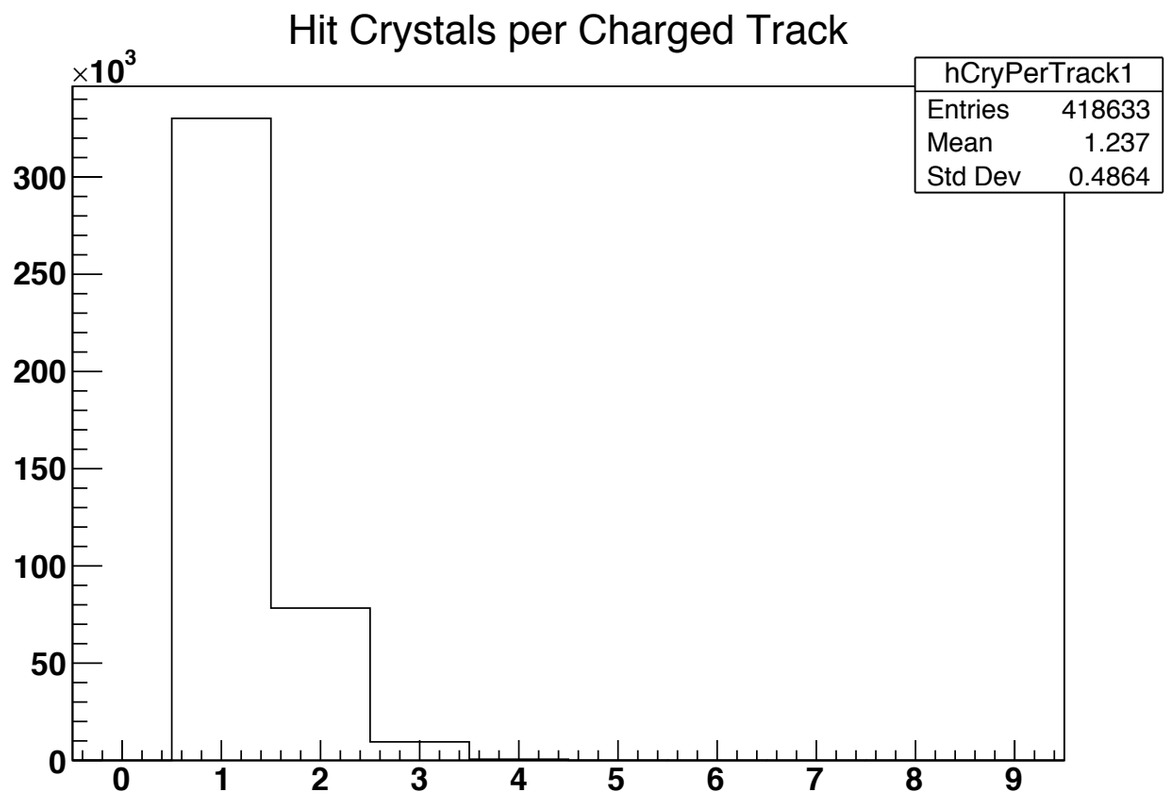
SiPM readout: to do list

- **Readout board successfully tested at CNAO (November 2019/ February 2020)**
- **Digitizers: V1740 vs. V1742**
- **Power supplies selected (CAEN SY5527 + supply boards – quantity to be defined)**
- **Orders to be placed**
- **Cabling, temperature readout to be defined**

Calorimeter: Software

- **Full geometry in the framework – but final configuration still to be defined**
- **Calibration / Reconstruction to be integrated**





Calorimeter DAQ

- **Assumptions: must store data for all crystals neighbouring a triggered one**
- **Data size**

  Occupancy: 3 fragments/event, 1.24 Cry/fragment = 3.75 Cry/event

  30 channels/event, Trigger rate: 1 kHz

  V1742: 1000 samples / channel, 12 bits/sample

  360 kbits / event, 360 Mbits/s

  45 kB / event, 45 MB/s

  XXXX (new): 125 samples / channel, 12 bits/sample

  45 kbits / event, 45 Mbits/s

  5.5 kB / event, 5.5 MB/s

- **Concept: DAQ PC receives data from digitizers via optical fiber and CAEN PCI board, performs zero-suppression and signal analysis, feeds common DAQ system**
- **beta version of local Data Acquisition and Compression tested at CNAO**

Mechanics / Temperature control: to do list

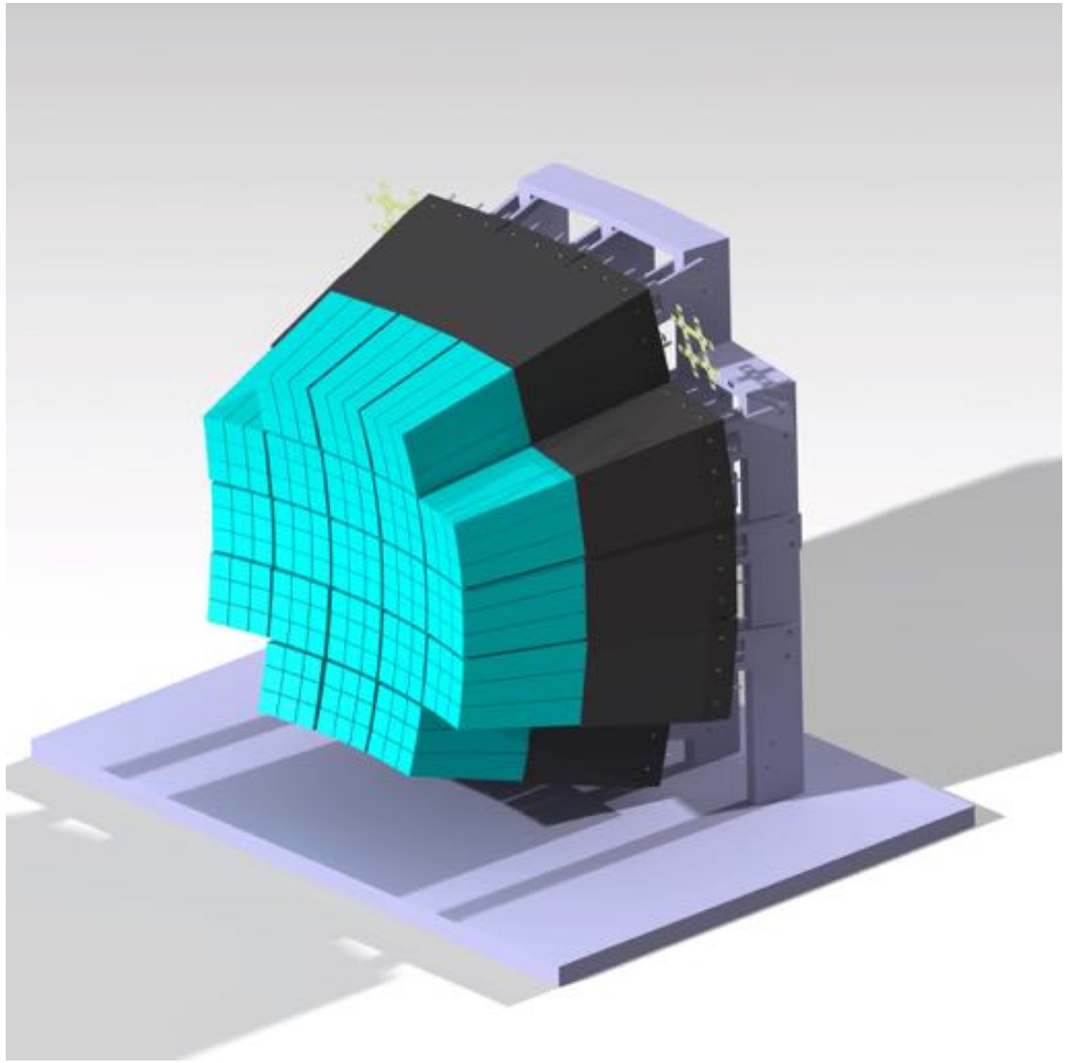
- **Requirements**

  nothing but crystals and air in the first 12 cm

  minimize air gaps, no long gaps in any direction

  no thermal control (maybe air cooling)

  dark environment



Open issues

- digitizer selection (1 GS/s, 125 MS/s)
- final mechanical configuration
- calibration

2020 plan

- start construction
- beam test to evaluate temperature stability
- take data with full module at HIT with p, He, C, O (?)

Status Report

Crystals: all set
SiPMs: in production
Readout: temperature sensor?
DAQ: integration to global to be started
Mechanics: full design

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