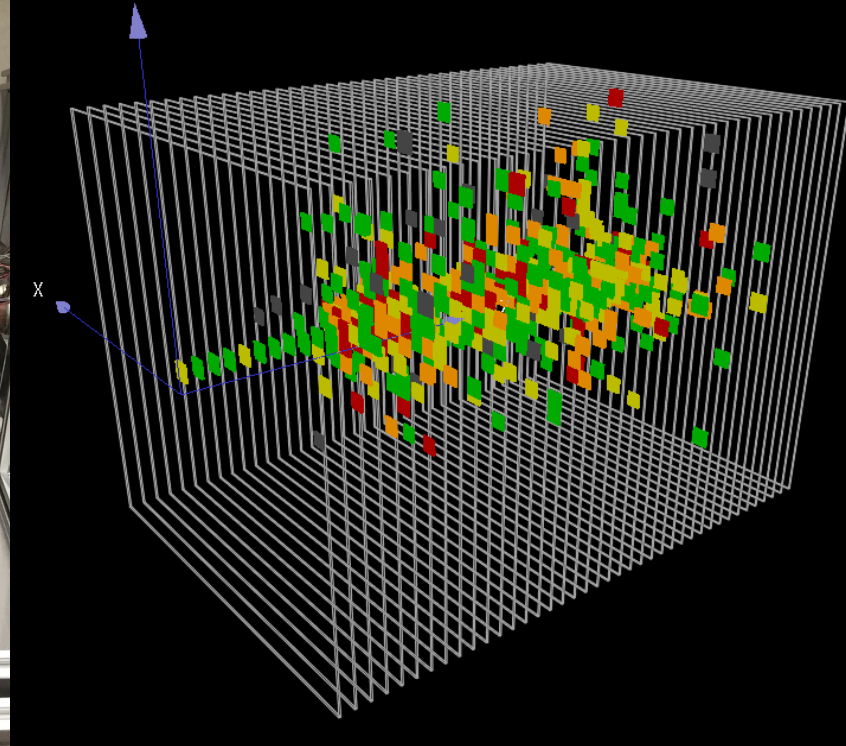
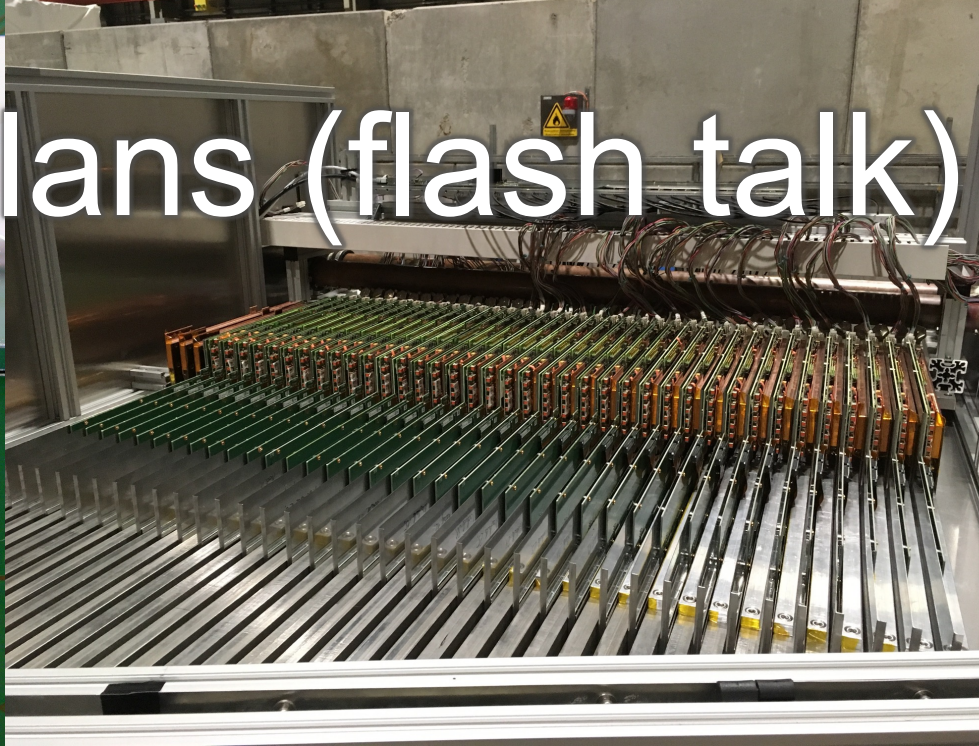
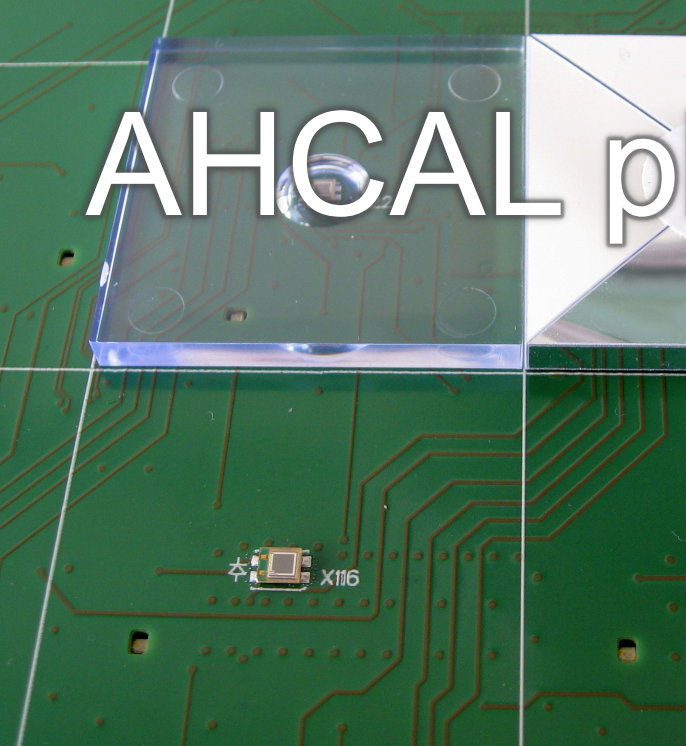


AHCAL plans (flash talk)



Katja Krüger (DESY)

CALICE Collaboration meeting, IJClab/LLR

13 October 2022

HELMHOLTZ RESEARCH FOR GRAND CHALLENGES

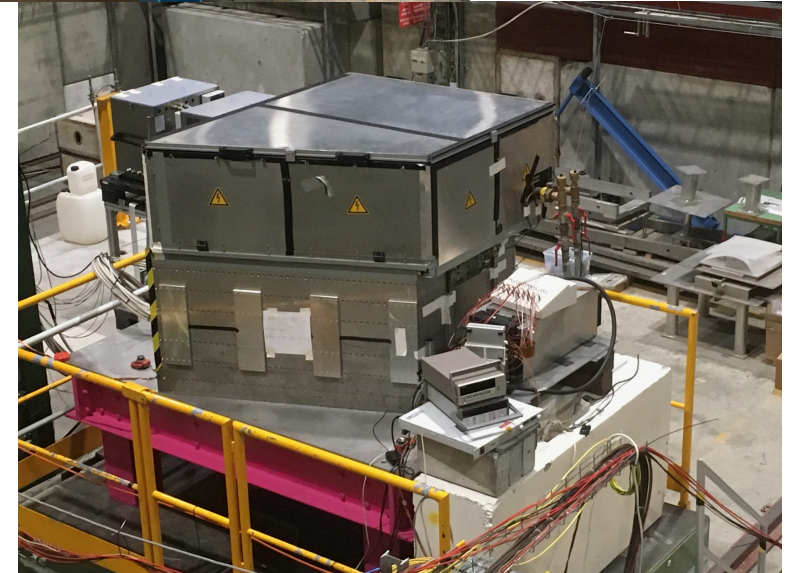


This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101004761.

AHCAL Plans I

Maximise output of existing large prototype

- Further testbeam program with large ILC prototype
 - SiW ECAL + AHCAL with better ECAL
 - AHCAL with tungsten stack
 - Ideally should include TCMT, especially for higher energies
 - Absorber structure exists
 - Active layers could be old scintillator bars with new SiPMs & readout electronics, or maybe SDHCAL layers?
 - Timescale: 2024+
 - Need to ensure sufficient funding not only for data taking, but also data analysis
- “Generic” Developments
 - Megatiles: performance of latest prototypes very satisfactory for MIPs -> include a layer in large prototype to see calorimetric performance



AHCAL Plans II

Develop technology for further applications

Studies towards AHCAL @ circular collider

- Continuous running
 - KLauS ASIC already supports continuous operation
 - SPIROC needs changes, but SPIROC3 should support continuous running
 - Also interfaces (power supplies) need to support this
- High data rates at Z pole
 - Expect ~100 kHz physics rate
 - For comparison: ~6 orders of magnitude more than HZ, but nearly an order of magnitude less than HGCAL L1A rate and smaller occupancy
 - Will have an effect on the readout system
 - Much higher data rates than for ILC -> faster bus/links
 - Maybe: change of the architecture needed (one link per ASIC instead of one bus reading many ASICs)
- Need realistic estimate of expected conditions -> simulation with CLD detector model
 - Understand active cooling needs
 - re-optimize absorber structure
- Develop hardware that can cope with these conditions

