

DRD6 Input Proposal: AHCAL

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CALICE Collaboration Meeting, March 2023

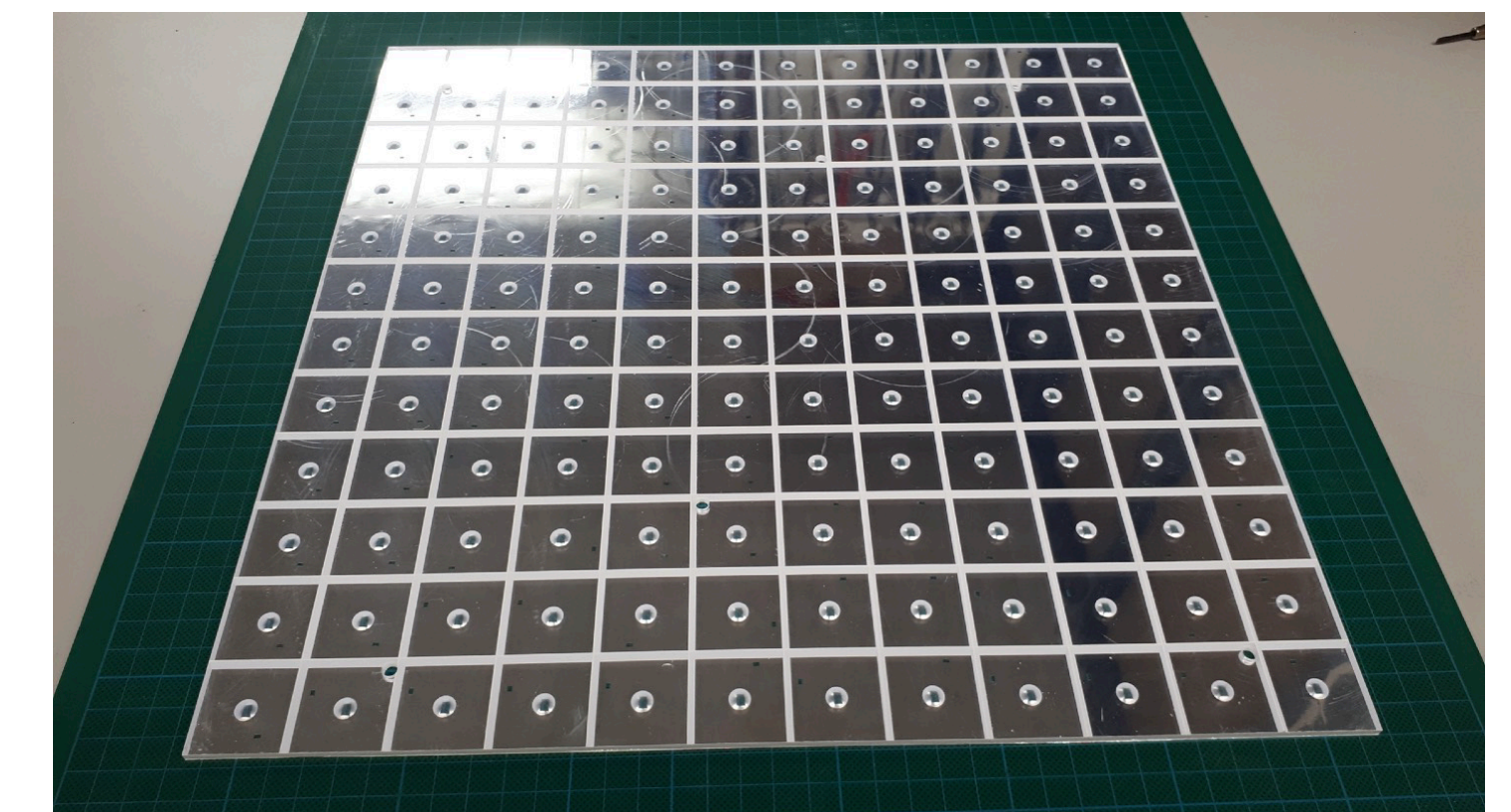
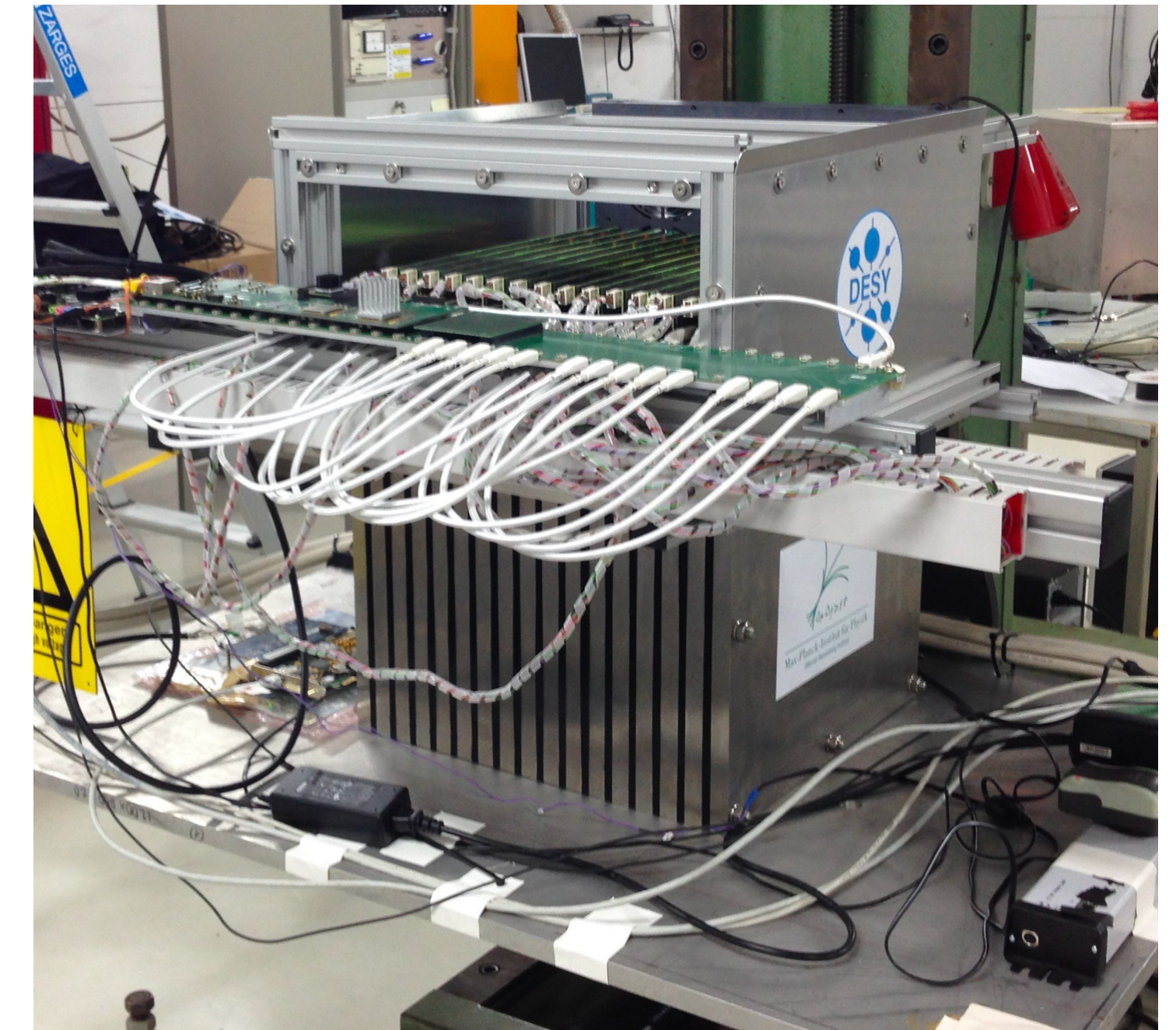
- The key next step for the AHCAL: Establish capability for running at circular collider (=FCC-ee) conditions on the system level.
 - The main aspect: Continuous readout, no power pulsing.
 - The most challenging situation: FCC-ee Z-pole running: 50 MHz bx-rate, 100 kHz Physics, ~ 200 kHz total
- *Main items to study:*
 - ⇒ Re-evaluate need for active cooling:
 - What would be the effect on energy resolution, PFA reconstruction, missing energy, tau ID, ...?
 - Can we avoid it by changing granularity, readout ASICs with lower power consumption?
 - ⇒ Evaluate consequences of higher data rates:
 - Do we need changes to data concentration strategy (trigger needed?)
 - Possible impact on powering, cooling, services
 - ⇒ Evaluate / re-optimize detector geometry (sampling structure, granularity), also in view of overall detector layout (maximum expected particle energy, magnetic field, tracker radius)

Central: All changes should not compromise the detector capabilities for Higgs physics!

Plans & People

Towards an input proposal

- Build a small AHCAL prototype (“EM stack”) with continuous readout with hit timing capability
- *Task sharing* between institutes working on CALICE AHCAL (DESY, U Göttingen, U Hamburg, U Heidelberg, KIT, U Mainz, Prague, Omega)
 - Front-End ASIC (HD, Omega)
 - Back-End / DAQ (KIT, Mainz, Prague)
 - Megatiles (Mainz)
 - Mechanics & Cooling (Mainz, HD, DESY)
 - Common tasks for all: software, testbeams, analysis, ...



will also form the basis for an application of German institutes to BMBF to be submitted early July.

