



# CALICE SiW ECAL – Status of Prototype

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On behalf of the SiW ECAL Groups in CALICE:



SiW Ecal Meeting – 1/10/2021

- Since August 23<sup>rd</sup> and until September 15<sup>th</sup> smooth operation of stack with 15 layers
  - Holdscans, Linearity scans by Yuichi and Adrian
- 15<sup>th</sup> of september, dismanteling of stack to ensure proper alignment
  - Essentially rails to prevent layer from lateral sliding, see picture
  - Approximate mechanical precision 1mm
  - All material ready (thanks to IJCLab mechanical workshop)
  - Re-assembly of stack foreseen on October 5<sup>th</sup>
  - Have to decide on arrangements of layers, i.e. Best layers to shower centre
- Only 12 W plates at IJCLab
  - Need 14 plates for complete setup
  - A 13<sup>th</sup> plate could be cut to proper dimensions at IJCLab workshop
  - W plates at LLR?
- Two more COBs equipped with ASICs over Summer 2021 (in addition to other two produced during Winter 2020/21)
  - In contact with LPNHE on wafer gluing, we'll select the two best ones
  - Next meeting Monday, not sure whether we'll make it for this beam test.

- **Transport**
  - Material will be transported by R.P. With IJCLab car
  - Slabs will be transported separately from mechanical housing in box staffed with foam
  - Material should be ready for transport on evening of 28<sup>th</sup> of October
- **Interlock system**
  - Will prepare a hardware interlock that will prevent rising of HV w/o low voltage
  - Cable from back of LV power supply to interlock interface at back of HV Keithley
- **FEV13**
  - One card equipped with SL Board at LLR
  - Will prepare material for a second FEV13 (plus material for deployment to Kyushu)
  - It is important that both FEV13 will be timely available at IJCLab for tests (next week?)
  - FEV13 will be mounted on carbon plates for easy insertion
  - **Operation voltage of FEV13**
- **Reassembly of stack**
  - Need to think about optimal arrangement of slabs
  - i.e. Best slabs in shower centre

- **Computing**
  - Will bring three computers plus one laptop to DESY
    - 1 computer for actual data acquisition (will be placed in beam area)
    - 1 computer for detector operation and data monitoring
    - Essentially 'rdesktop' to DAQ computer
    - 1 computer for DQ checks, data transfer and limited general purpose
    - 1 laptop for debugging and general purpose
- **Data management**
  - Data can be buffered on 1 TB local disk and then shipped to cernbox
  - Roman will try to mount disk array onto DAQ computer during October
    - Several TByte for buffer, maybe useful for local DQ checks
  - Data storage on grid?
- **Data monitoring and DQ checks**
  - We have a nice monitoring of the layer performance integrated into the user panel of the DAQ
  - We have neither high level data monitoring nor an event display
    - We most likely won't change this for November but this is a weak point
    - Need to care about this for 2022
  - DQ checks with scripts by Adrian in github
  - Adrian and Yuichi are familiar, need to train shift crew members on site
- **What else?**

- **The teams**
  - - Week 1/11/21 - 8/11/21
    - Adrian, Yuichi, Roman, Jihane, Dominique, Hector, Fabricio, Jesus
  - - Week 8/11/21 - 15/11/21
    - Adrian, Yuichi, Vincent, Alexandre, Jimmy, Jonas, Shusaku, Stephane
  - Please be present at the safety training(s) on 1/11/21 and 8/11/21 1pm
- **Conditions**
  - Currently only two shifters are allowed in the beam test hall, more during setup
  - Propose to run two shifts per day 8h-16h, 16h-0h
- **Coordination (proposal)**
  - Overall responsibility: Roman (1<sup>st</sup> Week), Vincent (2<sup>nd</sup> week)
  - Run coordination: Adrian

# Test beam preparation meeting

- Meeting will happen on 7/10/21 at IJCLab (+zoom), start 9am
  - CALICE reviewers: Jiri (FZU), Mary-Cruz (CIEMAT) and Shen Wei (UHEID)
- Agenda
  - 9h-12h presentations and discussion
    - Proposal for morning agenda
      - Introduction including mechanics 15+10 (R.P.)
      - Report from commissioning 15+10 (Adrian and/or Yuichi)
      - Introduction to DAQ System 15+10 (tbc.)
      - Coffee break
      - Run plan 15+15 (Adrian or Vincent)
      - Software for beam test simulation 15+10 (Fabricio)
  - Lunch
  - Workshop visit
  - Closed discussion by panel and preliminary conclusions with Ecal team

- 1<sup>st</sup> week
  - Setup (1 day)
    - Need to bring laser system for beam height etc.
  - Commissioning w/o tungsten (2-3 days)
  - Hold scan with beam?
  - Commissioning of additional layers
- 2<sup>nd</sup> week tungsten program
  - Several energy points with high statistics
  - Different positions, e.g. Scan over wafer boundaries

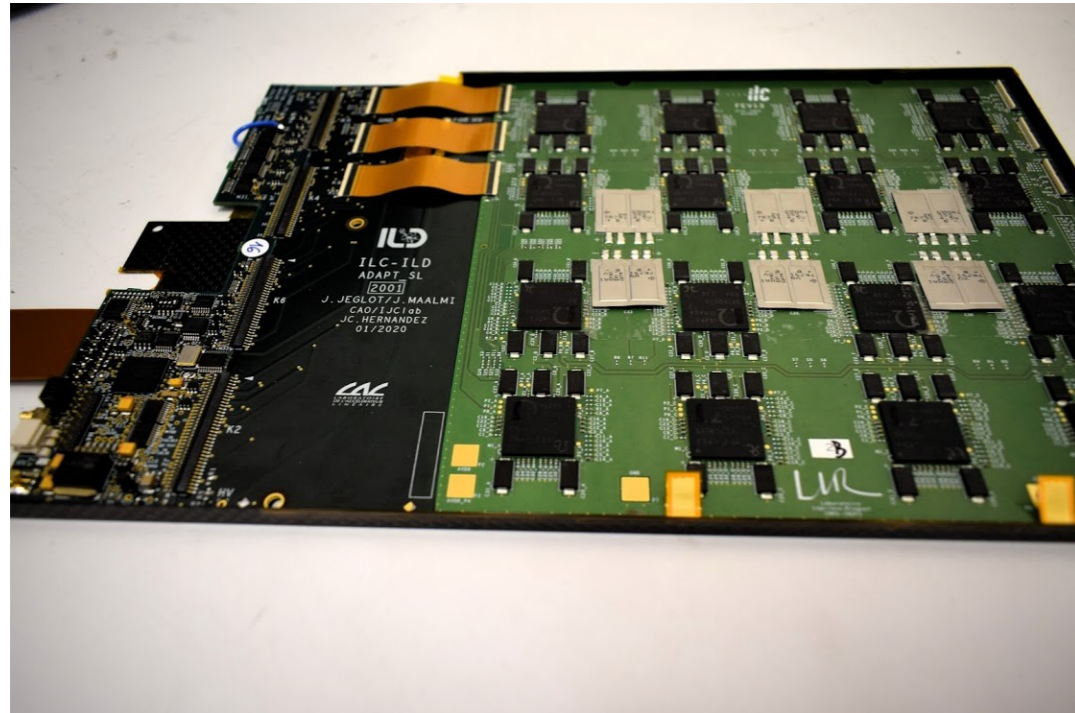
SLAB	DESY 2017		CERN 2018		Comments and 2020 status
	status	calibrated cells	status	calibrated cells	
13		0%		0%	Glue spilled in the SMBv. Recovered for 2020
14		0%		0%	Error in the SR return → fixed
15		0%		0%	Stopped working during the 2017 commissioning. Recovered for 2020
16		92%		?	Delaminated wafer, repaired at LPNHE
17		93%		95%	Delaminated wafer, repaired at LPNHE
18		94%		?	At CERN : a pattern of lower MIP values is seen in the center of the ASU.
19		93%		93%	
20		94%		96%	
21		54%		0%	Stopped working at DESY 2018. Fully recovered for 2020
22		84%		87%	
23		0%		0%	FEV10 Never used → operational now.
24					FEV12 (Summer 2019)
25					FEV12 (Summer 2019)
26					Damaged COB with only one wafer
27					Damaged COB with only one wafer
28					COB : One Chip broken, operational and ready for gluing but bent
29					COB : Operational and ready for gluing but bent
30					FEV12 freshly produced in Autumn/Winter 2020/21, under test
31					FEV12 freshly produced in Autumn/Winter 2020/21, under test
32					New COB
33					New COB

*Slabs < Slab24 are FEV10 or FEV11*

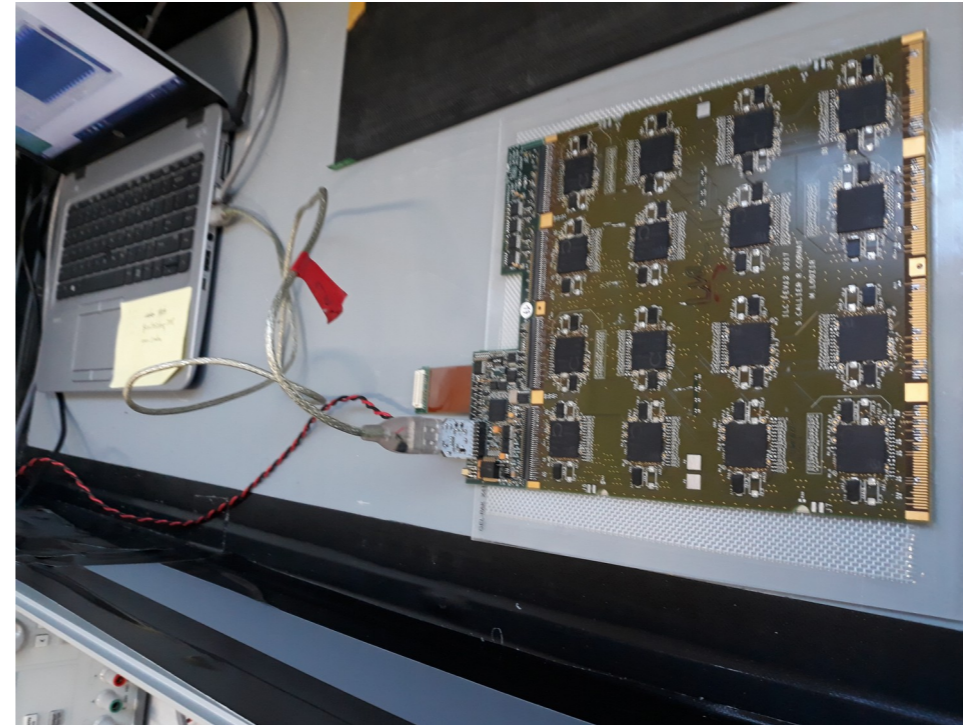
Update of FEV13 see talk by Jerome ?



# Backup



FEV13 connected via interface card to SL-Board



New FEV12 on single slab test bench

- **Interface card for allows for integration of FEV13 in stack**
  - Successful technical tests in Autumn 2020
  - In total 7 FEV13 equipped with wafers are available in F and JP
- **Started to deploy Hardware/software for digital readout (i.e. SL-Board and User Interface) to other Ecal groups**
  - First “client” LLR
  - **IFIC will follow during visit of Adrian end of May/June, as soon as travel will be possible**
  - **In preparation of deployment to Japan is planned**

# 15 Slabs setup 02/06/21

coreKapton slot	Layer position	Slab ID	ASU type	wafer	front end (slboard ID)	Glissiere neded for the W	W in front (mm)	X0	X0 (acc)	Comments/Issues
14	0	31	FEV12	500						
shot 13	1	30	FEV12	500						
12	2	13	FEV11	320	10	2.1mm	2.1	0.6	0.6	
11	3	14	FEV11	320	5	2.1mm	2.1	0.6	1.2	
10	4	15	FEV10	320	1	2.1mm	2.1	0.6	1.8	
9	5	19	FEV11	320	13	2.1mm	2.1	0.6	2.4	
8	6	20	FEV11	320	11	2.1mm	2.1	0.6	3	
7	7	24	FEV12	500	7	2.1mm	2.1	0.6	3.6	Stable AVDD ??
6	8	21	FEV11	320	14	2.1mm	2.1	0.6	4.2	
5	9	25	FEV12	500	3	2.1mm	2.1	0.6	4.8	problems communicating the ID of the SLboard ?? (SOLVED)
4	10	22	FEV11	320	4	4.2mm	2.1	0.6	5.4	
3	11	23	FEV10	320	6	4.2mm	4.2	1.2	6.6	
2	12	16	FEV11	320	9	2.1mm	2.1	0.6	7.2	
1	13	17	FEV11	320	2	4.2mm	4.2	1.2	8.4	problems communicating the ID of the SLboard ?? (SOLVED) Stable consumption ?? -> SOLVED shortcut in DVDD (capacitance in skiroc 14)
0	14	18	FEV11	320	0	whatever (no W will be added)	4.2	1.2	9.6	