SI-W ECAL Long SLAB results

By

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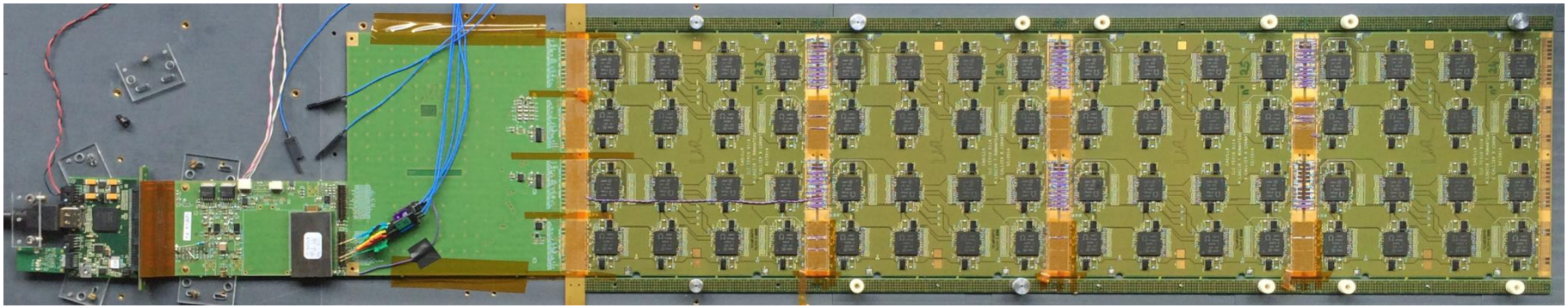

CALICE Meeting 7-9 March 2016

SI-W ECAL Long SLAB

Topics

- Status
- Interconnexions
- Clock spreading
- Problems observed
- Next steps

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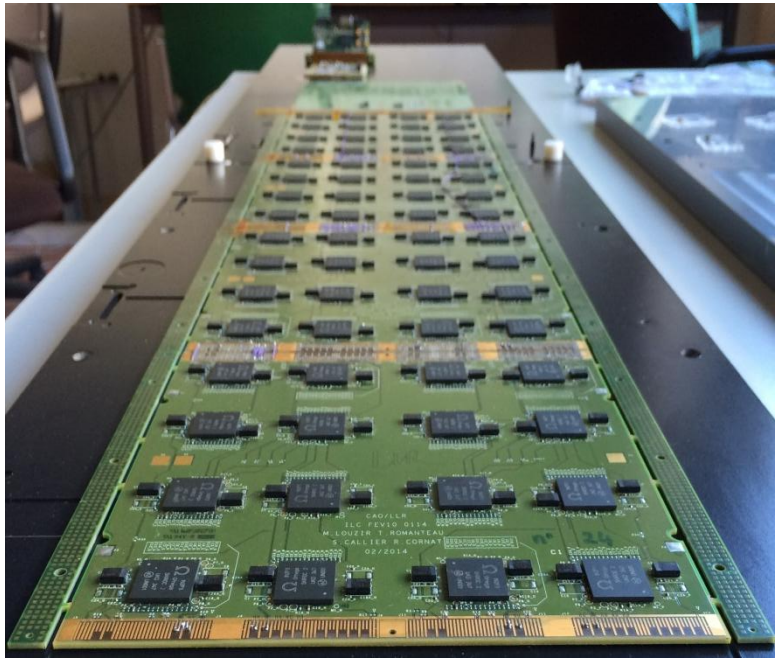
Status

- 4 cards connected
  - Control command: ✓
    - **calicoes/pyrame:** https://llr.in2p3.fr/sites/pyrame/calicoes/documentation/index.html
  - Slow control: ✓
  - Readout: ✓(only 3 ASU)
  - Clock spreading: ✓
  - Analysis: on going (root script to upgrade) ✓

Readout problem:
no start readout signal on 4th ASU; short circuit or PCB damaged (due to too many attempts for interconnects).



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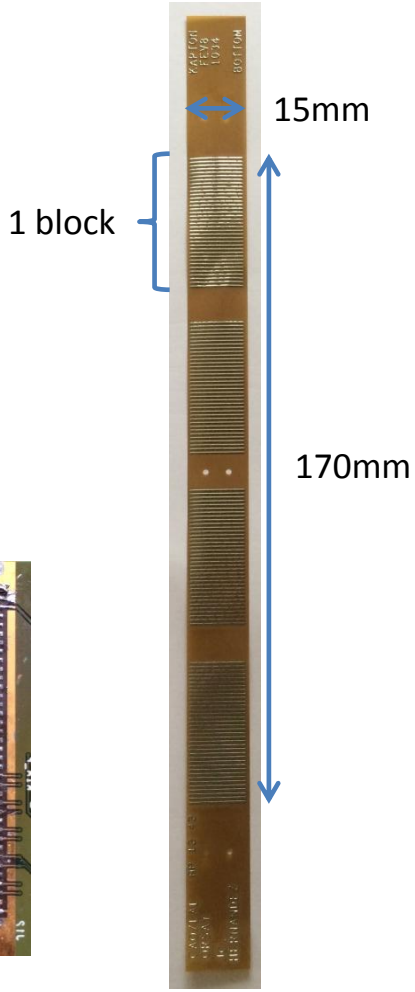
Interconnexions

- Solution used: kapton
  - Solder per block at T>450°C
  - Unappropriate temperature profile
    - Short circuit under BGA possible
    - Problem fixed
  - Short circuit dectected under Kapton
    - Kapton replaced by small wires

Short-circuits detected



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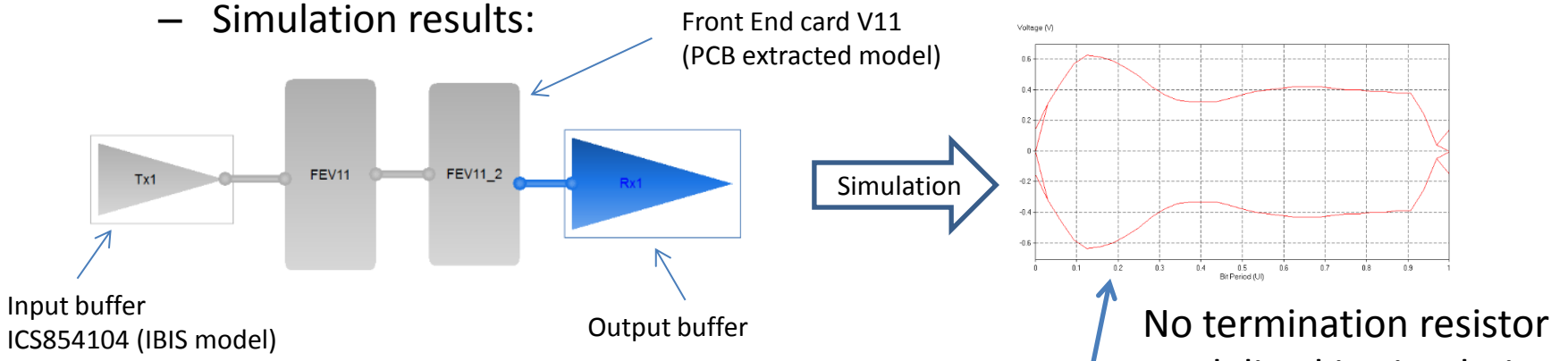
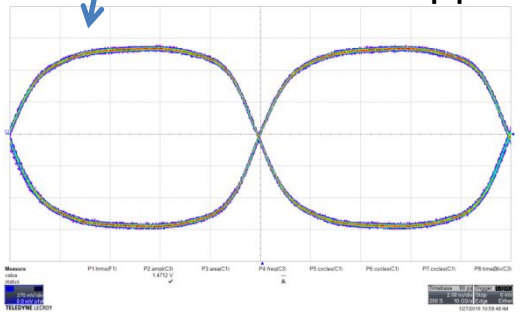
Clock spreading

- Simulation analysis for 2 ASU:
  - R-C Modelisation of clock transmission line for each ASU (included bounding, pad, packaging and PCB trace and via): **50pF ; 2,7Ω** using **Cadence® Sigrity**
  - Simulation results:



- Measurements: fast clock after 4 ASU
  - Skew: 400ps
  - Jitter: 150ps
  - Eyes well opened
  - Clock parameters keep (F, T_r, T_f,Vpp)
  - **100Ω termination resistor needed**

No termination resistor modelised in simulation
➔ bounces appears



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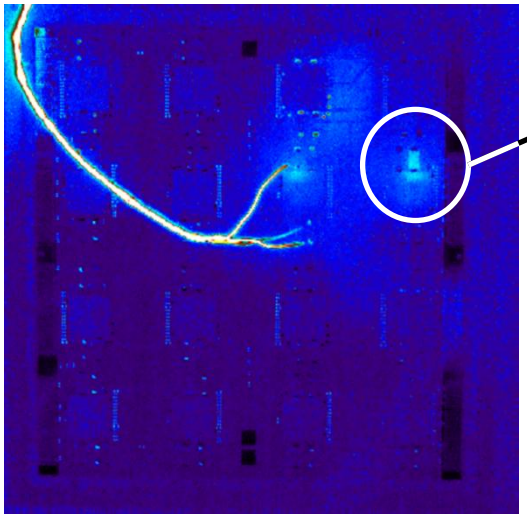
Problems observed

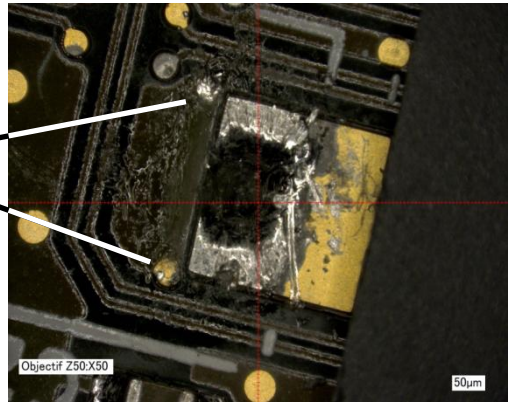
- Short circuits:
  - 5 ASU received March 2015
    - 2 ASU in short circuits Vddd! – gnd!



Problem arround decoupling capacitance for SKIROC chip

2 vias of gnd! too close from vddd! capacitance connexion.

Problem fixed ✓



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Next steps

- Get 8 to 10 cards chainned
- Glue baby wafers on edges
  - Adapt mecanical support
  - Analyse: Scurves, Noise and Cosmic ray detection
- Update root scripts => data analysis
- HV kaptons (studies and conception done, wait for production)
- Long slab clock spread integrity simulation for 8/10 ASU
- Power supply analysis for 8 cards

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The end

Thanks for your attention

Any question ?