# Report from CALICE DAQ Task Force

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(Kyushu University, Japan)

# CALICE DAQ Task Force

- Experts' meeting discussing common DAQ
- Members
  - Silicon: R. Cornat, F. Magniette, T. Suehara
  - Scintillator: J. Kvasnicka, M. Reinecke
  - Semi-digital HCAL: L. Mirabito, C. Combaret
- 2 years of mandate
- ~ 1 meeting per month
  - 4 meetings held

# Targets

- Common DAQ
  - Common clock and acquisition cycle (AC)
  - Synchronized data taking and event matching
  - Common run control
  - Interface to upper control (TLU?)
- Combined testbeam
- Minimize total work by sharing tasks

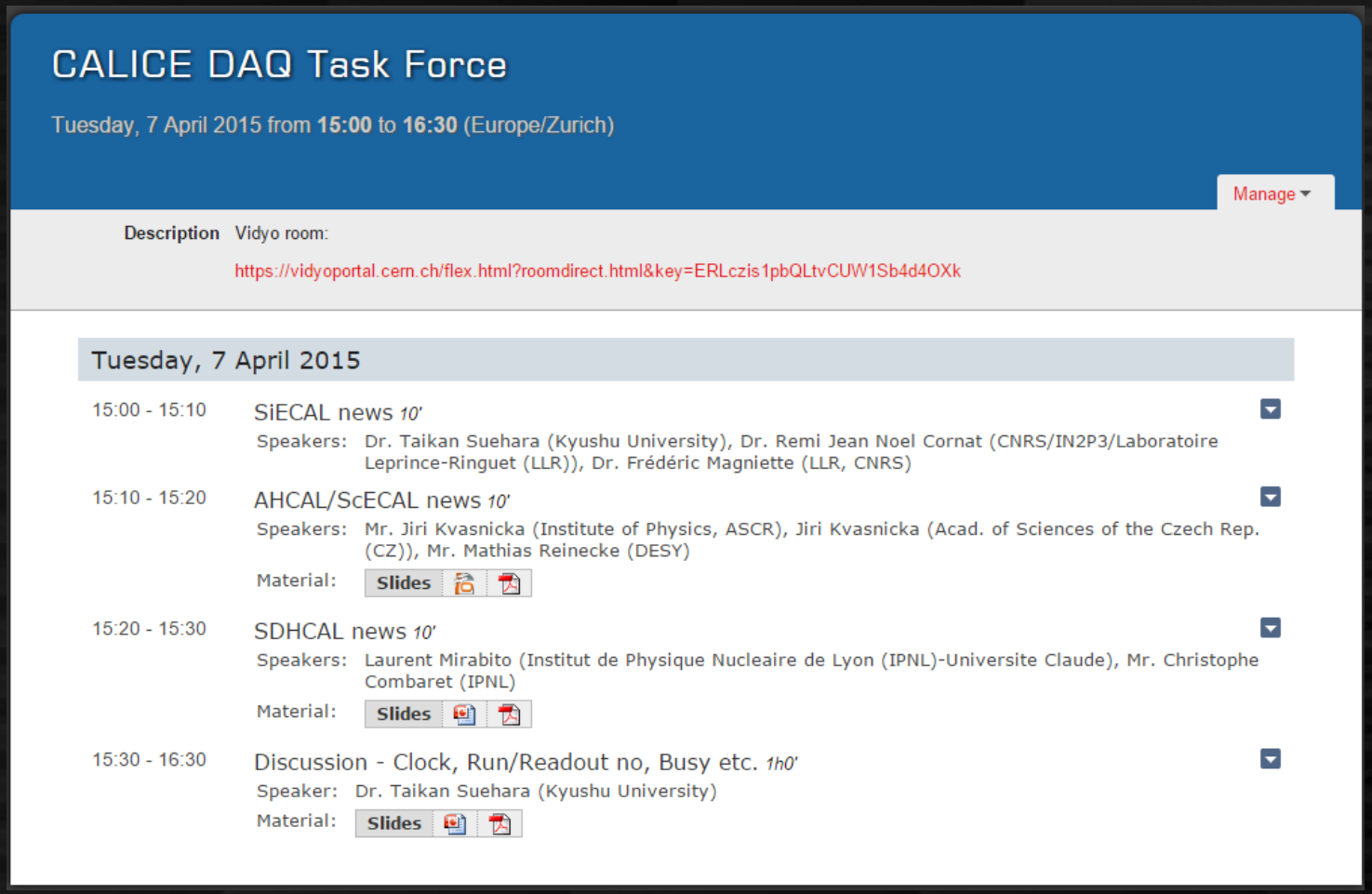
# Past meetings

1. 10 Dec 2014
   - Task overview
   - Select coordinator
2. 19 Jan 2015
   - Overview each subsystem
3. 4 Mar 2015
   - Discussion on clock
4. 10 Apr 2015 (wo/ Si experts)
   - Discussion on BX, Acq#, Run, Timestamp etc.

# Indico

https://agenda.linearcollider.org/category/156/

Public



CALICE DAQ Task Force

Tuesday, 7 April 2015 from **15:00** to **16:30** (Europe/Zurich)

Manage

**Description** Vidyo room:

https://vidyoportal.cern.ch/flex.html?roomdirect.html&key=ERLczis1pbQLtvCUW1Sb4d4OXk

Tuesday, 7 April 2015

15:00 - 15:10 SiECAL news *10'*

Speakers: Dr. Taikan Suehara (Kyushu University), Dr. Remi Jean Noel Cornat (CNRS/IN2P3/Laboratoire Leprince-Ringuet (LLR)), Dr. Frédéric Magniette (LLR, CNRS)

15:10 - 15:20 AHCAL/ScECAL news *10'*

Speakers: Mr. Jiri Kvasnicka (Institute of Physics, ASCR), Jiri Kvasnicka (Acad. of Sciences of the Czech Rep. (CZ)), Mr. Mathias Reinecke (DESY)

Material: Slides

15:20 - 15:30 SDHCAL news *10'*

Speakers: Laurent Mirabito (Institut de Physique Nucleaire de Lyon (IPNL)-Universite Claude), Mr. Christophe Combaret (IPNL)

Material: Slides

15:30 - 16:30 Discussion - Clock, Run/Readout no, Busy etc. *1h0'*

Speaker: Dr. Taikan Suehara (Kyushu University)

Material: Slides

# Master clock

- 'Master CCC' will provide clocks to each CCC
- 5 MHz is the basic clock corresponding to BX
  (or go into the real ILC BX period??)
- Need 50 MHz for Silicon because
  no PLL in Si-CCC
  (maybe done in master CCC)
- Scintillator and SDHCAL can produce their clock from the master clock
- Clock will be communicated
  via either HDMI or LEMO

# Synchronization (Tentative)

- BX synchronization
  - Each detector has different inactive time after the start_acq
  - Master CCC sends start_acq (via either fast command or LEMO) with configurable delay (set by PC) to each port to synchronize livetime of each
- Busy
  - Treated by Master CCC to determine stop_acq and next start_acq
  - Should be sent from each subsystem

# Synchronization (2) (Tentative)

- Acquisition cycle (or readout cycle)
  - Use AC counter from each subsystem to check the synchronization
  - Start from 0 at each run
  - Cross-check of 'Spill' sync by time-stamping (at lowest possible level of each subsystem)
- Run
  - Common run number notation:
    XXXYYYYY, XXX is the common TB number
  - No limit for the run length
    typical run period should be O(1h) - O(1d)

# Who provides 'Master-CCC'?

- Scintillator
  - Zedboard with Xilinx Zync (FPGA + ARM CPU)
    (commercial, ~300 EUR/board)
    + Mezzanine (can be provided by DESY/Mainz)
  - Firmware is in active development
    (DESY / Mainz? / possibly Kyushu?)
- SDHCAL
  - No manpower
- Silicon
  - ?

# Software

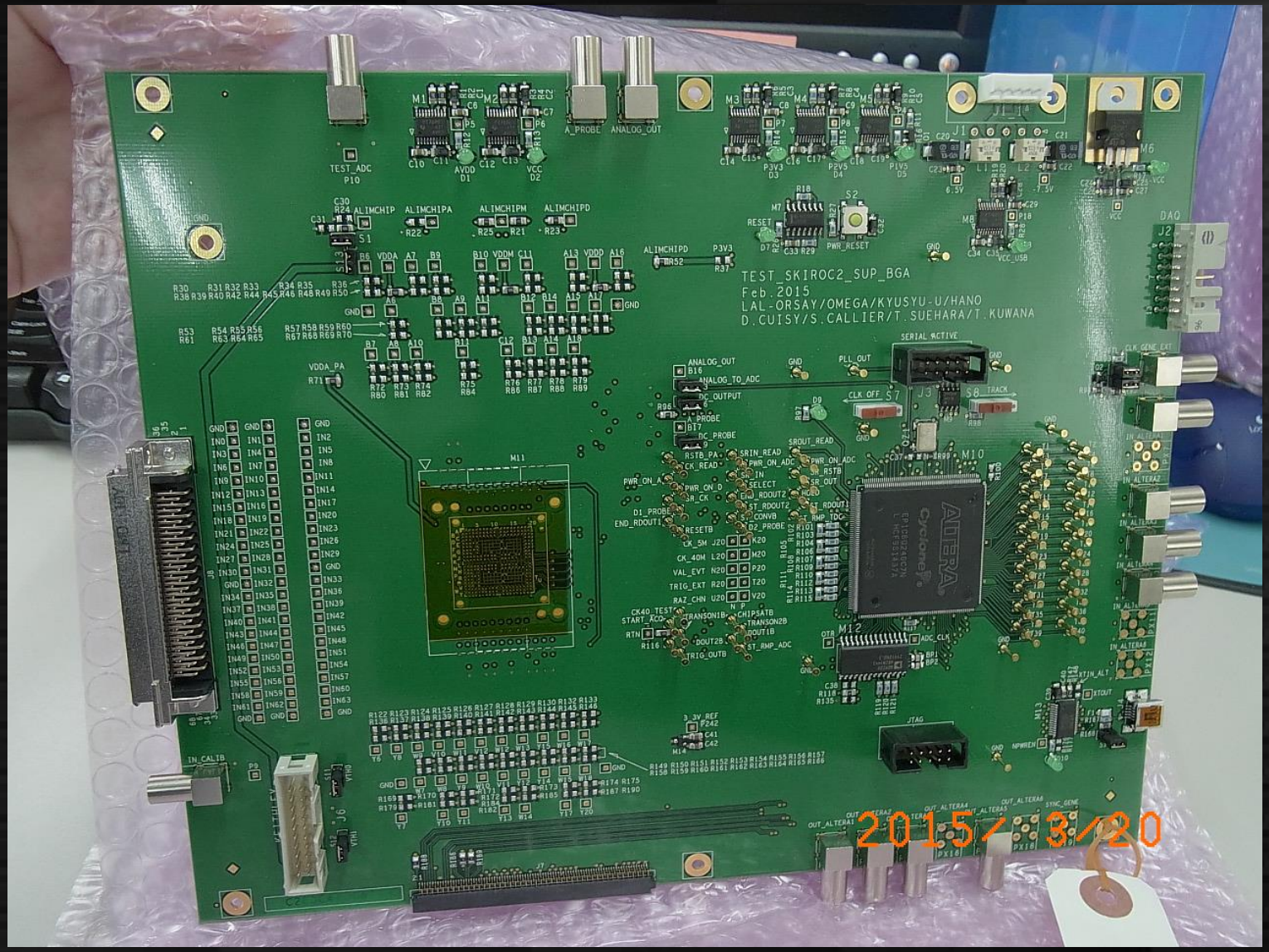
- No discussion yet

- EUDAQ
- LCIO
- etc.

Current priority to specify baseline design of hardware of common DAQ

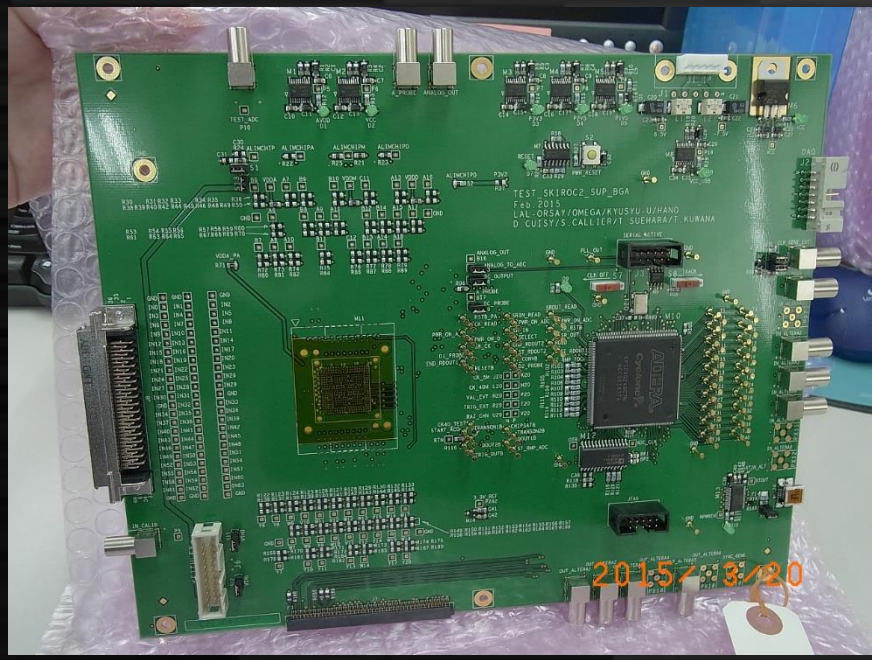
# A few word about recent Kyushu activity

# SKIROC2 BGA testboard



# SKIROC2 BGA testboard

- Delivered at March
  - Two boards on 1st batch one is in modification
- Based on OMEGA TB
  - QFP → BGA
    - Two kind of sockets Ironwood & SER (jp)
  - Connector for sensor
- Two interface
  - Readout by OMEGA FPGA (worked last Friday!)
  - Readout by Silicon DIF (not tested yet)



# DAQ activity plans in Kyushu

- Testbeam analysis (H. Hirai's talk)
- Investigate various characteristics of BGA SKIROC with the testboard
- FEB11 production (in plan)
- Combined DAQ
- Online monitor
- Automatic test of sensor/electronics
  - Laser, RI (for crosstalk, gain etc.)
- ...