

# SDHCAL activities dashboard

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# Hope you're doing well

## Coronavirus outbreak

- Europe (Belgium, France, Spain) : back to some kind of confinement.

# Ongoing activities

## Test beam analysis

### all TB

- Uniformity (on hold ?)
- Low Energy hadrons (Bing+SJTU)
- Uses of BDT (Bing+SJTU) Published.

### 09/2018 only

- SiWECAL+SDHCAL (Hector+CIEMAT : (done ?))
- Tricot electronics (GG, Imad (?) on hold (?))

### 2015 only

- Analysis with rotated device (**Hector**)

# Ongoing activities

## Hardware

- 2m<sup>2</sup> GRPC+HR3 ASU+ new DIF (Lyon+ CIEMAT )
- Timing electronics (CMS muon for strip and SJTU for SDHCAL pads): Board design, first results expected in december.
- Cooling for CEPC (SJTU)
- SJTU lab (SJTU)

## Simulation

- ILD SDHCAL simulation/reconstruction performance monitoring (Camilo, CIEMAT)
- Tricot simulation (on hold)
- Timing in simulation (developments by Guillaume Garillot → Analysis by Imad)
- Prototype simulation upgrade (Multithreading, CEPC version, ...) (François)

# Ongoing activities

## grid

- Transferring SDHCAL data from file catalogue LFC to DiracFC (Gérald)

## PFA

- ArborPFA → APRIL (Bo, → GG, on hold )
- Rand Index (GG, on hold)
- PFA with timing (Bo+Imad)

## Digitisation

Incorporate GRPC response modeling to digitiser, (Clermont+Lyon).

## ILD/CEPC Analysis

- $e^+e^- \rightarrow Z \rightarrow \text{jets}$  then  $e^+e^- \rightarrow ZH \rightarrow \text{jets}$  (CIEMAT)
- $e^+e^- \rightarrow \gamma\gamma VV$  (Bing)
- include FCC-ee also ?

# AIDA++ $\Rightarrow$ Aidanova status

## AIDA 2020 Expression of Interest

- EOI #145 PFA (ARTIC) : Included in software WP (50 k€).
- EOI #58 Timing SDHCAL and EOI #57 Tricot electronics : merged and included in WP gaseous detectors  $\Rightarrow$  Aidanova : reduced financing (50 k€, Mary Cruz representative)

## SDHCAL removed from high granularity calorimeter WP

AIDA++ 2<sup>nd</sup> Open meeting at CERN, 09/23,

<https://indico.cern.ch/event/838461/>

# Published papers

## Recent

- SJTU+Lyon work : JINST 14 (2019) no.10, P10034  
<http://inspirehep.net/record/1762795>.
- CHEF 2019 proceedings :
  - JINST 15 (2020) 05, C05016. <https://arxiv.org/abs/2002.09678>
  - JINST 15 (2020) 05, C05022.  
<https://inspirehep.net/literature/1826123> 7 pages document available only on journal website.
  - There were 3 SDHCAL talks at CHEF 2019
- BDT paper
  - **Published**, D. Boumediene et al 2020 JINST 15 P10009.  
<https://inspirehep.net/literature/1790235>
  - Preprint at <https://arxiv.org/abs/2004.02972>
  - The mismatch between the paper and the CHEF 2019 proceeding is fixed in inspireHEP and in HAL.
  - **Still mixed in CERN CDS** (<http://cds.cern.ch/record/2715408>)

# Publications

## Papers, short term

- Current analysis of test beam data (GRPC uniformity, low energy hadrons, ...) ?

## Notes in preparation

- Bo : APRIL PFA (on hold, **Bo got a position in a chinese university**)
- Bing : Low energy hadrons + uniformity studies
- Hector : analysis with rotated devices.

## Papers, medium term

- More on GRPC response modeling by Clermont ?



# Coming meetings

## Recent workshops

- CALICE Collaboration meeting, Sept 28-30, 2020  
<https://agenda.linearcollider.org/event/8608/>
- AWLC 2020 (Americas Workshop on Linear Colliders), October 19-22, online  
<https://conf.slac.stanford.edu/awlc2020/>

## Coming workshops

- FCC workshop, November 10-13, 2020, online  
<https://indico.cern.ch/event/932973/>
- 3rd CEPC Workshop EU Edition, May 4-7, Marseille, **POSTPONED to spring 2021** <https://indico.in2p3.fr/event/20053/>

# Coming conferences

## Abstract closed



## Open to abstract

- HEPChile2021, January 4-8 2021, Valparaiso, Chile,  
<https://indico.cern.ch/event/698387/> (**POSTPONED** to 2022)
- CALOR2020 → **CALOR2021**, May 17-21 **2021**, Sussex, UK,  
<https://indico.cern.ch/event/847884/> (abstract 12/7/20 to 03/26/21)
- TIPP 2020, May 24-29, British Columbia, Canada, **CANCELED**  
<https://indico.cern.ch/event/864722/> (abstract up to 04/24/20)
- PANIC 2020, **POSTPONED** August 30 - September 3 **2021**, Lisbon, Portugal,  
<https://indico.lip.pt/event/592/> (abstract will reopen in 2021)
- PIC 2020, **POSTPONED** <https://pic2020.physik.rwth-aachen.de/>

# More specialized meetings

## Electronics

- Pico-second timing detectors, July 1-3, Zurich, Switzerland, <https://indico.cern.ch/event/861104/>, **POSTPONED** to June 16-18 2021

## Advanced software

- IML Machine Learning Workshop, June 2-5, CERN, **POSTPONED to October 19-22** <https://indico.cern.ch/event/852553/> Lots of potentially interesting talks
- ACAT 2020 (Advanced Computing and Analysis Techniques in Physics Research) September 8-12, Daejon, South Korea, **POSTPONED** to end of 2021 <https://indico.cern.ch/event/855454/>, abstract up to 04/07/2020

# Request from CALICE

## News from autumn 2019 CALICE Meeting

- Message from Roman. Clean/update the CALICE twiki page.  
<https://twiki.cern.ch/twiki/bin/view/CALICE/SdHCal>

# ILD regular meetings

## ILD group meeting November 10th

- <https://agenda.linearcollider.org/event/8959/>
- Next week

## ILD Analysys/software meeting November 4th

- <https://agenda.linearcollider.org/event/8935/>
- Not enough space to keep all sim and rec files. Proposal : Keep only 10% or 500 files per process. Alternative ILD option studies with limited statistics.  
To be discussed today
- Talk on heavy neutral lepton searches and stau searches.
- Validation of new flavour tag.
- Vertex finder with deep learning.
- Next meeting November 18th

# Snowmass 2021

- American particle physics strategy update
- Currently discussed in all future collider projects.
- ILD preparation : LOI, simplified ilcsoft, delphesLC card  
<http://ilcsnowmass.org/>
- Energy Frontier workshop was held July 20-22  
<https://indico.fnal.gov/event/43963/overview>
- Process planning meeting Oct 5-8,  
<https://indico.fnal.gov/event/44870/overview>

# Snowmass 2021 and CALICE

Input for the Instrumentation Frontier

<https://snowmass21.org/instrumentation/start>

- Dominant themes for calorimetry : High granularity, Dual Readout, PFA, timing
- CALICE has submitted not 6 but 10 proposals  
<https://agenda.linearcollider.org/event/8647/>
  - **Timing-SDHCAL (Imad)**
  - Generic R&D on timing layer in calorimeters (Frank Simon)
  - Scintillator Strip ECAL
  - SiW ECAL
  - Common compact readout for CALICE calorimeters (for ILD option 1) (Katja, Roman, Taikan)
  - AHCAL (Katja, Felix)
  - High granularity crystal ECAL.
  - DHCAL (José).
  - ALICE FoCal improved.
  - New sensors for SiW ECAL.

# SDHCAL meeting day

- Survey to determine best week day for meeting : <https://eventorenater.fr/survey/day-for-the-sdhcal-meeting-kjvo9wrr>
- 9 answers
  - Thursday 7 yes (+1 maybe)
  - Tuesday 5 yes
  - Wednesday 3 yes (+2 maybe)
  - Monday 3 yes (+1 maybe)
  - Friday 1 yes (+1 maybe)
- Keep Thursday as meeting day.



# Outlook

## Flash info

- BDT paper published.
- Bing PhD defense this november.

Don't hesitate to add any important activity, paper, or conference, I may have miss.

## Next meetings

Europe (winter) 9-11 / China 16-18 / Korea 17-19

- November 19th (Europe winter time)
- December 3rd
- December 17th
- End of year break, reconvene in January.

# Backup

## Past meetings

- LCWS2019, October 28 - November 1 2019, Sendai,  
<https://agenda.linearcollider.org/event/8217/> : one talk by Bo on APRIL PFA
- CEPC workshop, November 18-20, IHEP, Beijing,  
<https://indico.ihep.ac.cn/event/9960/>, a SDHCAL talk by Bing.
- CHEF2019, November 25-29, Kyushu,  
<https://indico.cern.ch/event/818783/> 3 talks (Bing, GG, Djamel)
  - PID with Boosted Decision Tree (Bing)
  - Digitizer (Djamel)
  - APRIL PFA (GG)
- RPC2020, February 10-14, Roma,  
<https://agenda.infn.it/event/19942/> No abstract submitted
- Spring 2020 CALICE meeting, March 4-6, McGill  
<https://agenda.linearcollider.org/event/8343/overview> Very little SDHCAL presence (2 persons)  
One talk by Mary-Cruz

## Past meetings (II)

- FCC France, May 14-15, By video,  
<https://indico.in2p3.fr/event/20792/>
- CALICE analysis meeting, May 20  
<https://agenda.linearcollider.org/event/8526/> (one talk by Hector)
- CALICE analysis meeting, July 30, 2020  
<https://agenda.linearcollider.org/event/8585/> (one talk by Bing)