

# Minutes: Taskforce Meeting on CERN Testbeam Data (Feb. 9, 2023)

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Time: 11:00 AM → 12:10 PM (GMT+8)

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🔗 **indico page** (<https://indico.ihep.ac.cn/event/18835/>)

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## Participants

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- IHEP: Baohua, Dejing, Hengyu, Peng, Yuzhi, Xin, Yong
- SJTU: Haijun, Siyuan, Zhen, Zixun, Jiyuan
- USTC: Hongbin, Jiaxuan, Yukun
- Tokyo: Wataru, Ryonosuke, Tatsuki, Yuki

(Chair and minutes by Yong)

## Talks and discussions

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- Status talk by Tatsuki
  - Issue reported in last meeting
    - Observation: 5 temperature curves from the same temperature sensor
    - Discussion: due to temperature data format for decoder?
  - Issue: ECAL pedestals
    - Observation: other peak structures than the major pedestal peak
    - Discussion: (DAQ experts' feedback) due to the long time window without any hits, pedestal values will increase; these shifted pedestals would be removed with timing info
    - Remaining question: what quantity can be used for the timing info?
  - Strip Split Algorithm (SSA) is implemented
  - Action items
    - Further discussions with USTC DAQ experts on the two issues
- Continued discussions on the LCIO versioning reported by Yuzhi
  - LCIO versioning conflict in CEPCsoft and Francois' decoder
  - Action items: further discussions on Mattermost to solve this problem
- ECAL and AHCAL data preparations

- ECAL full data sets fully processed by Jiaxuan (Mattermost message)
  - all the raw data files with e+ and pi+ beam, (in the high-low gain mode) have been converted to root files
  - Original root files: /cefs/higgs/wangjx/ScECAL/Result\_Diagnose/decode/
  - Calibrated root files: /cefs/higgs/wangjx/ScECAL/Result\_Diagnose/calib/
- HCAL muon data sets fully processed by Yukun (Mattermost message)
- HCAL alone: /cefs/higgs/shiyk/Beam\_2022/DataBase/RawRoot/HCAL\_alone/mu+
- ECAL+HCAL combined:
  - /cefs/higgs/shiyk/Beam\_2022/DataBase/RawRoot/Combined/mu+
- Simulation and validation: Baohua
  - First MC results with digitisation implemented
    - Photon statistics (in Poisson distribution)
    - SiPM non-linearity with fixed #pixels
    - Assuming photons detected by SiPM at the same time (ideal exponential) -> 2nd order corrections for pixel recovery effects (to be done)
  - Preliminary results
    - Photon statistics effect is not significant in the AHCAL simulation setup -> this is as expected due to the percent level sampling fraction
    - Better resolution after digitization -> to be further checked, e.g. energy linearity curve
    - SiPM saturation and energy cut lead to a shift in the detected energy
- Further important information from Mattermost
  - ECAL data set: directories
    - /cefs/higgs/wangjx/BeamData/ECAL\_Filename.txt
  - ECAL data decoder
    - /cefs/higgs/wangjx/ScECAL/Diagnose/src
  - HCAL data set: directories
    - /cefs/higgs/shiyk/Beam\_2022/BeamData/HCAL/Particle/DatList.txt
  - HCAL data decoder
    - /cefs/higgs/shiyk/Beam\_2022/Decode/HBUAna\_Cherenkov