ECALp -
documentaton issues / ideas

Gitlab.desy.de

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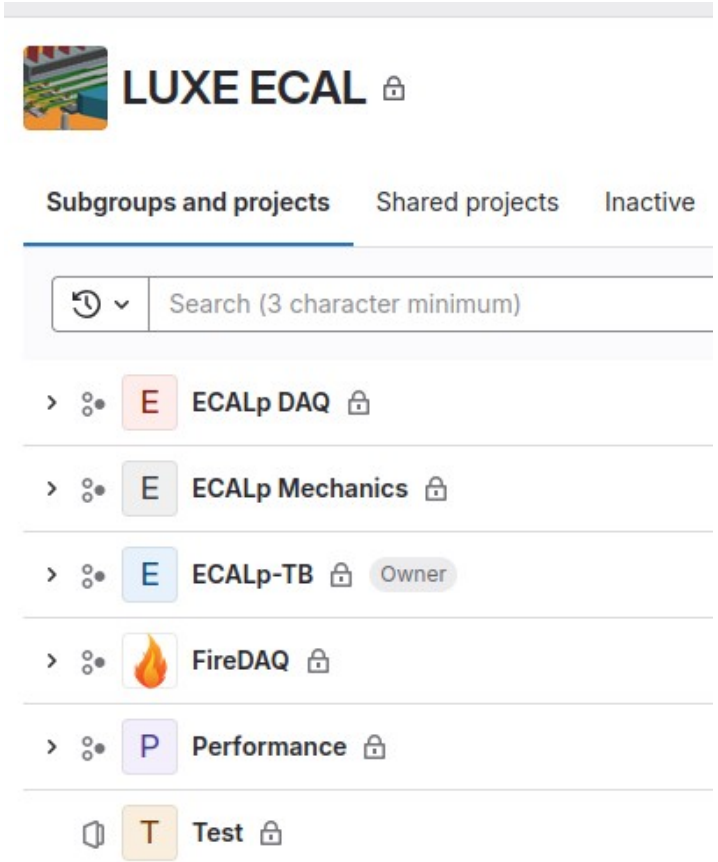
- **Already existing code** repository (gitlab) hosted by DESY.
  - https://gitlab.desy.de/luxe-ecal
- Jakub proposed to use it for design (electronics+mechanics) documentation sharing
  - Used since 1-2 years → keep going!
  - Also includes common software for TB2022 (Shan, Melissa, Michal, Dawid...), DAQ (Jakub) and placeholders for future performance studies
  - We should all make an effort and not discontinue this effort which is very convenient for all,
- (minor?) Caveats:
  - Requires a DESY account (automatic for LUXE members)
  - Requires 2FA for login.



Example: ECALp-CSIS gitlab-code

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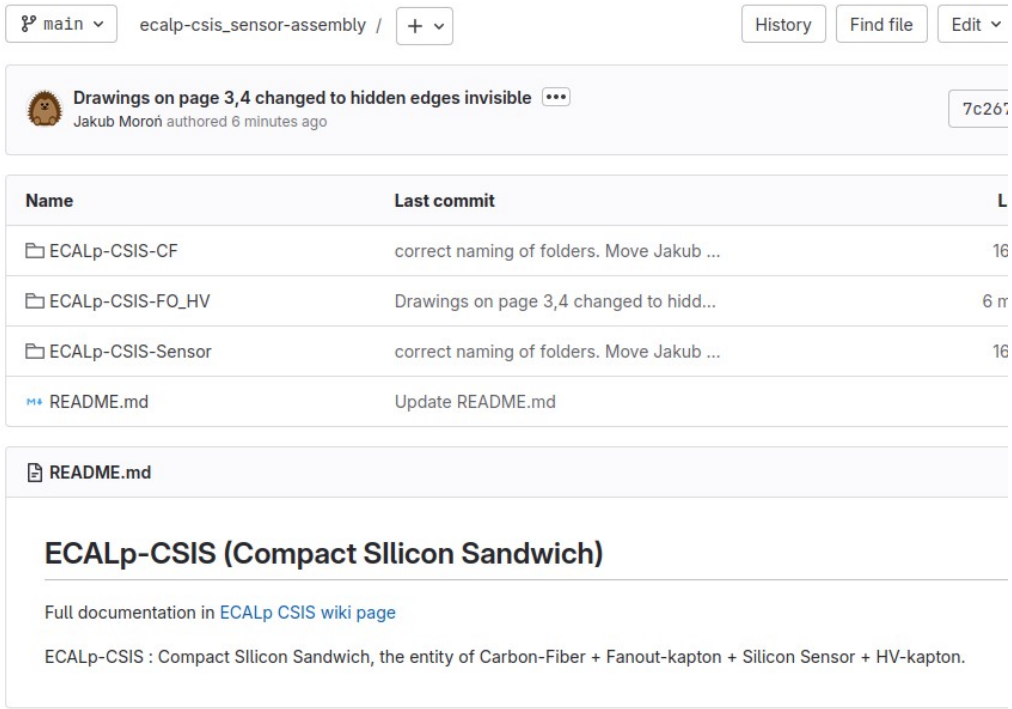
- https://gitlab.desy.de/luxe-ecal/ecalp-mechanics/ecalp-csis_sensor-assembly
- Contains folders for
- ECALp-CSIS-CF design and production notes
  - Designs by Carlos
- ECALp-CSIS-FO_HV (fanouts)
  - Designs by Jakub (defining length of connector fanout sections).
  - The final fanout deisgn should be here.
- ECALp-CSIS-Sensor
  - Basic information on the sensor (datasheet, inventory?) - work in progress.
- Missing:
  - ECALp-GluingJig, ECALp-Adheshives...



Notes on the code repository of gitlab

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- Extremely convenient,
  - Specially for finalizing electronics, mechanics designs by different teams.
  - Emphasize (me the first!) on keeping it up to date.

- Still, even now, the number of designs and contributions by different teams is considerable
  - Difficult to keep track of all changes (different styles of designs, different expertise, etc...)

- PROPOSAL: use also the wiki facility of gitlab.
  - Which is part of gitlab (no need user creation, no need of new framework...)

Example: ECALp-CSIS gitlab-wiki

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▷https://gitlab.desy.de/luxe-ecal/ecalp-mechanics/ecalp-csis_sensor-assembly/-/wikis/ECALp-CSIS-twiki

ECALp CSIS twiki

Edit

Last edited by **Adrian Irles** 16 hours ago

ECALp-CSIS: Compact SIlicon Sandwich for the ECALp of LUXE

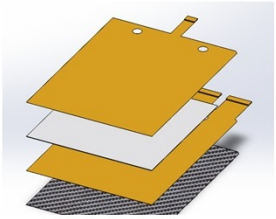
Documentation of the design, manufacturing and cross-requirements with other components necessary for the ECALp module

Documentation maintained by C. Orero, A. Irles (IFIC - CSIC/UV) and ECALp-LUXE team.

CSIS description

The ECALp CSIS is the single active unit of the ECALp for LUXE, aka HighCompactCalo of the DRD6. It is designed as a compact sandwich with less 1mm of total thickness made of:

- CSIS-CF: Two-direction Carbon Fiber foil
- CSIS-Adh-CFFO
  - adhesive layer between CF and FanOut
- CSIS-FO: Fanout-kapton with 256 pads and traces
- CSIS-Adh-FOSe
  - adhesive layer between FanOut and Sensor pads
- CSIS-Sensor
- CSIS-Adh-SeHV
  - adhesive layer between Sensor backplane and HV kapton
- CSIS-HV: HV kapton



Content of the repository

1. ECALp-CSIS-CF
   - contains the mechanical drawings of the ECALp-CF for manufacturing.
   - contains inventory and summary of CMM of the manufactured ECALp-CFs
   - Important: the dimensions of the CSIS-FO and CSIS-HV are not fixed in this document; only visual designs are provided.
2. ECALp-CSIS-FO_HV
   - contains the design of the FanOut kapton and the design of the HV kapton
3. ECALp-CSIS-Sensor
   - contains information of the sensor dimensions and characteristics.
   - shal it also include sensor-characterization results and required software ? (tbd)
4. **ECALp-Adhesives**
   - contains information on the glue/tapes researched and used.
5. **ECALp-GluingJig**
   - Design, tooling and procedures for gluing

Mechanics

Mechanical requirements/dimensions

Overall thickness has to be below 1mm: 1mm (+0mm -0.1mm)

- CSIS-CF:
  - with a design value of 200um thickness, 90x120mm^2 and two Ø6H7 positioning holes
  - Holes' position and shape are defined in agreement with
  - a) TFrame design and measured tolerances (Ø6g6 (5.988 - 5.996mm) tabs spaced 47mm // 90.2 mm between CSIS sensors). **Or is it Ø5.990 ± 0.005 mm tabs??**
  - b) ECALp-CSIS-GluingJig
  - The final design (for TB2025) was decided in ECALp-Krakow meeting Sept 2024
- CSIS-FO: FanOut-kapton with 256 pads and traces
  - dimensions 90xYYYmm^2, <100um thick and two positioning holes
  - YYY size defined by TFrame and FEB
  - Design is work-in-progress (TAU+AGH Krakow)
  - ***Carlos, Yan?? Confirmation**** needed**
  - Total thickness to be set by manufacturer and to be measured at IFIC(?)
  - Hole tolerances Ø6 ± 0.05 and general tolerance of ±0.1. If the tolerances are **coarse** it may be needed to have a slotted hole in the kapton (as well as in the CF) or make the holes bigger (for example Ø6.050 ± 0.050 mm)
- CSIS-HV: HV kapton
  - dimensions 90xYYYmm^2, <100um thick and two positioning holes
  - YYY size defined by TFrame and FEB
  - Design is work-in-progress (TAU+AGH Krakow)
  - Hole tolerances Ø6 ± 0.05 and general tolerance of ±0.1. If the tolerances are **coarse** it may be needed to have a slotted hole in the kapton (as well as in the CF) or make the holes bigger (for example Ø6.050 ± 0.050 mm)
  - ***Carlos, Yan?? Confirmation* needed**
  - Total thickness to be set by manufacturer and to be measured at IFIC(?)

Connectivity

Connectors for CSIS-FO and CSIS-HV

- CSIS-FO
  - plug on FO https://www.hirose.com/product/p/CL0480-0804-0-51
  - Socket on FEB https://www.hirose.com/en/product/p/CL0480-0805-0-51
- CSIS-HV
  - plug ?
  - socket ?

Example: ECALp-CSIS gitlab-wiki

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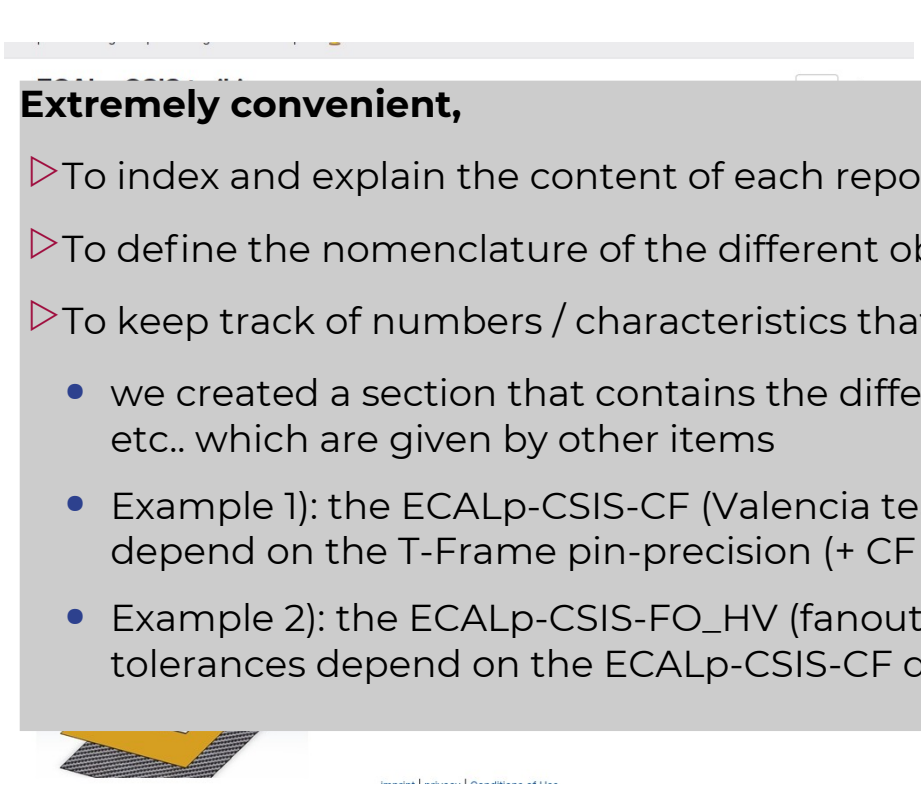

Extremely convenient,

▷To index and explain the content of each repository and guide the others

▷To define the nomenclature of the different objects, pieces

▷To keep track of numbers / characteristics that are critical for other designs →

- we created a section that contains the different tolerances for dimensions, positioning holes, etc.. which are given by other items
- Example 1): the ECALp-CSIS-CF (Valencia team) hole positions/shape/size and tolerances depend on the T-Frame pin-precision (+ CF manufacturer precision)
- Example 2): the ECALp-CSIS-FO_HV (fanouts – Jakub and Yan) hole positions/shape/size and tolerances depend on the ECALp-CSIS-CF design (+ the kapton manufacturer precision)

Beyond gitlab

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- Not very convenient for large files or files that are prompt to be updated or that will need to be shared with people outside the collaboration (or outside the developper team).

- For the TB2022 paper we took another approach
  - A.I. created a cernbox folder in my own personal cernbox → this folder is accessible and editable by everyone that is in possession of the link https://cernbox.cern.ch/s/QUuRQbl8uJVgfR1
  - Every contributor to the paper has its own folder where they drop plots, tables, etc for Wolfgang/Halina to use them in the draft writing.
  - Michal created a folder with material for presentations.

- New proposal: consolidate this approach by creating a group cernbox
  - This is doable at CERN, with no major justification needed.
  - Complete/reading/writing access can be given to any one with a cern-account.
  - Moreover, public folders can also be created.

Example: ECALp-CSIS gitlab-code/wiki + cernbox

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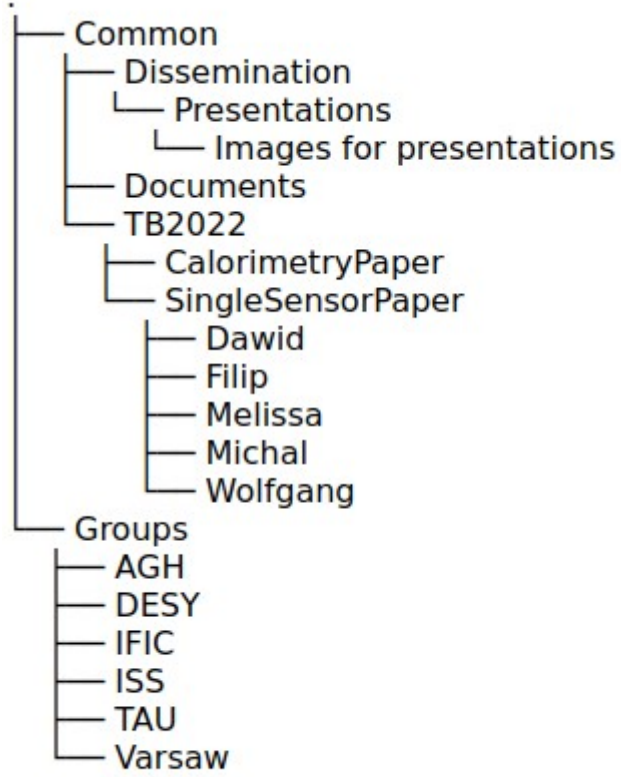
- In Valencia we plan, when full CSIS are provided, to create individual passport files for each one, containing all technical data of the modules, including sensor characterization and evolution of performance.
  - This information does not fit in the gitlab code or wiki repository – but it fits in the cernbox.
- Gitlab-code repository will be used for design / software development matters
- Cernbox would be used to store passports and detailed tests on the assembly / test
- Gitlab-wiki will be used for:
  - Index and description of everything in gitlab and cernbox
  - documentation
  - Adding proper links to the cernbox

Finally, the proposal

- Keep using gitlab for code, design as proposed by Jakub
  - Special emphasis on keeping updated the hardware designs - Detailed implementation proposals are being discussed among experts
  - Also useful for the analyzers !
- Start using the wiki of gitlab (as the example).
  - Each team taking care of their own documentation and of filling the gaps of others
- If everyone agrees, I could take care of creating a cernbox for the group
  - With this type of folder hierarchy
  - We could propose to have only a couple of admins per group and create folders with common access for everyone (as the TB2022 folder)



Examples of twikis, cernbox

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- ECFA – HET wiki https://gitlab.in2p3.fr/ecfa-study/ECFA-HiggsTopEW-Factories
- CALICE testbeam wikis https://twiki.cern.ch/twiki/bin/view/CALICE/SiWDESY201706
  - These are very useful for analysis and documentation… !!
- Cern hosted webpage created in a cernbox project space
  - https://ttj-phenomenology.web.cern.ch/
  - It is a simple front-page with links to cernbox folders (no write access given through these links).
  - Only the members of the ttj team are able to modify the webpage or the content in the cernbox folders.