

RD-FCC/WG1

Physics & Software

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Published! Feasibility Study Reports

And a YellowReport on Future HTE factories



<https://cds.cern.ch/record/2928193>

<https://cds.cern.ch/record/2928194>

<https://cds.cern.ch/record/2928793>



<https://arxiv.org/pdf/2506.15390>

02/10/2025 Physics Briefing Book

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Physics Briefing Book

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<https://cds.cern.ch/record/2944678>

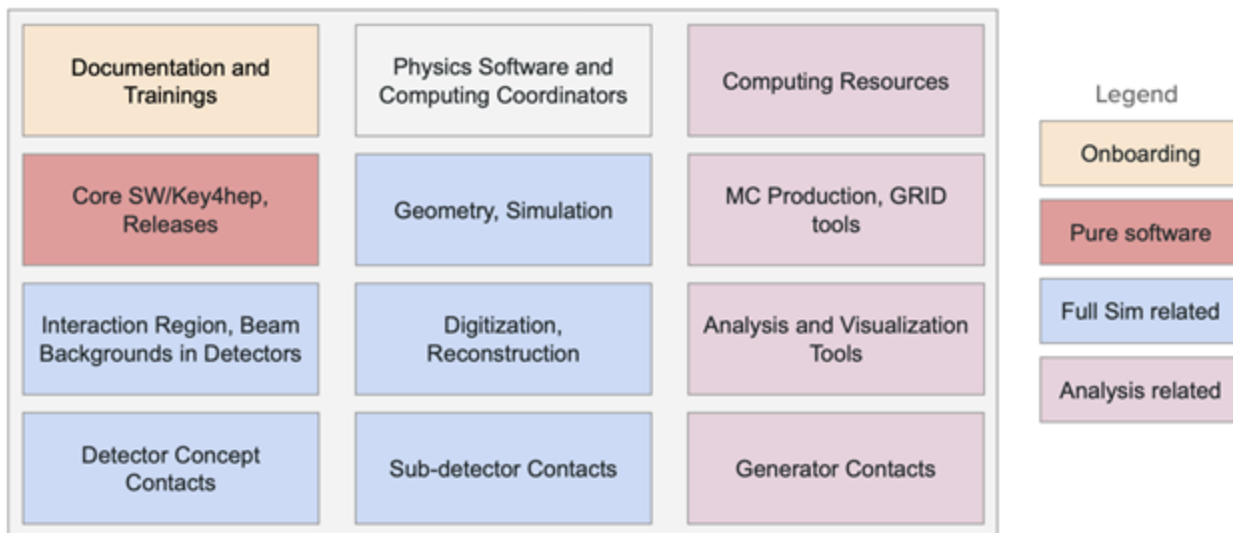
From CERN: Reorganization of PED for pre-approval phase (~2028)

- Reorganization of Coordination Areas mandates and creation of new sub-groups, call for new conveners
- Detector Concepts has already sent the call.
- Phys. Programme and Phys. Performance will merge into a single Physics WG
- Software and Computing has also a new structure. Some groups are in common with Physics, some with Detectors.
- New structure should be fully in place by “Physics Workshop” in Munich in January 26-30, 2026
<https://indico.cern.ch/event/1588696/>

Possible new substructure for the Physics Software and Computing group



NOT APPROVED YET



- In PHYSICS proposing new groups in collaboration with SW:
- High-level reconstruction
- Monte Carlo tools (in close collaboration also with Precision sub-group)

Software Activities in Italy in 2025

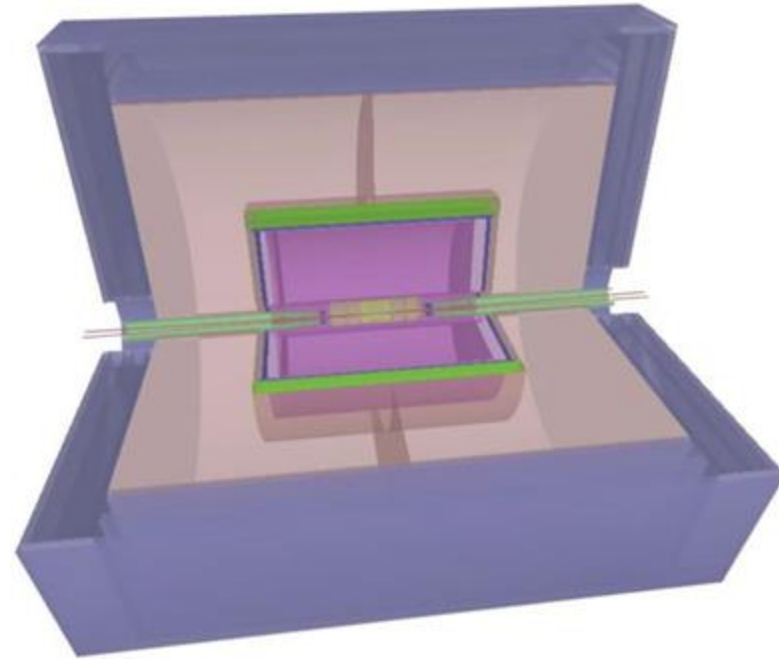
INFN Software activities focused on the IDEA detector concept. Progress on:

- simulation, digitization and reconstruction of the various components
- implementation of new ML algorithms
- beginning of studies for background effects in the tracking (Vertex and Drift chamber)
- **would like to understand the interest of the community given all the new tasks that are opening up with the availability of a more mature software ecosystem.**
- Start making plans for the next years (also thesis/grants/etc)

IDEA geometry in key4HEP

- **Full Simulation developments rely on accurate geometry description.**
- Key4Hep allows also to modify and replace “easily” different components.
- FCCDetectors new repository where the IDEA concept steering files are kept
- Plug&play: for instance DC used in other detector concepts (ALEGRO)

<https://github.com/HEP-FCC/FCCDetectors/tree/main/Detector/DetFCCeeIDEA>



<https://doi.org/10.48550/arXiv.2502.21223>

FOCUS TODAY

- Focus on the latest developments & resources
- **Drift Chamber:**
 - Digitization of DC hits
 - dN/dx reconstruction with ML
 - final 2021/2022 testbeam results
- **GNN Track reconstruction & fitting of IDEA tracker**
- **Muon Detector:**
 - track reconstruction and fitting
 - studies on standalone performance in Fast and Full-Simulation
- **Status of Calorimeter Simu & Reco**

REMINDER - Info for WP1 Physics and Software

- We have a web page: https://web.infn.it/RD_FCC/
- https://web.infn.it/RD_FCC/wp1/ **need to update!**
- Meeting on Physics: will send doodle for November
 - Is Wed morning a good time?
- Let's keep track of publications & thesis & talks
- “IDEA study group” meetings, next one on October 21, <https://agenda.infn.it/event/48481/>
- Look at material shown at the “FCC-ee Workshop on Particle Flow Reconstruction” held at CERN, September 1-5