

Status of software and simulation

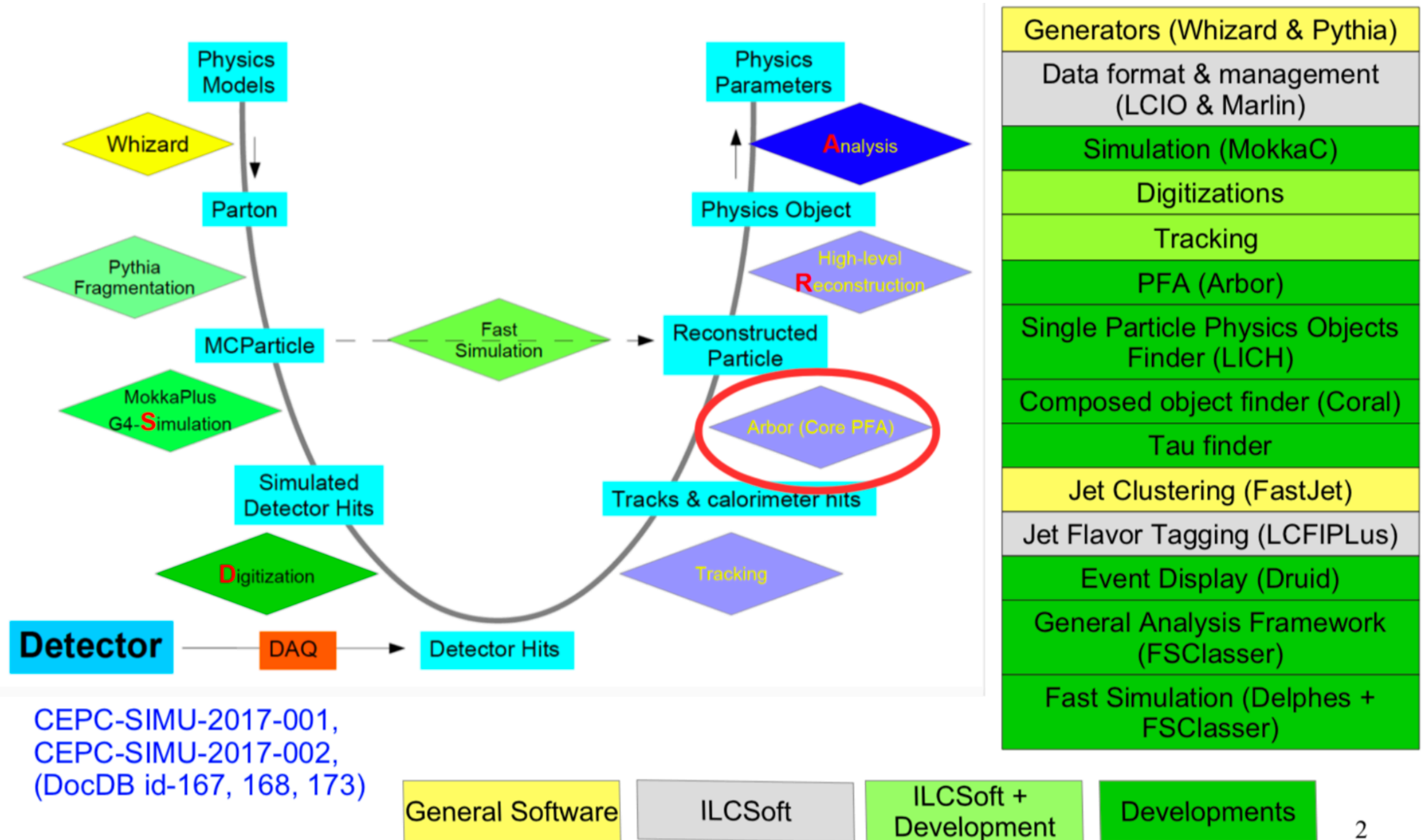
G. Li

Aug 14, 2019

outline

- New software framework
- DD4HEP— detector description
- Common tracking
- Fast simulation efforts
- Others
 - ☑ Implementation of new calorimetry

We did a lot with CEPCCsoft

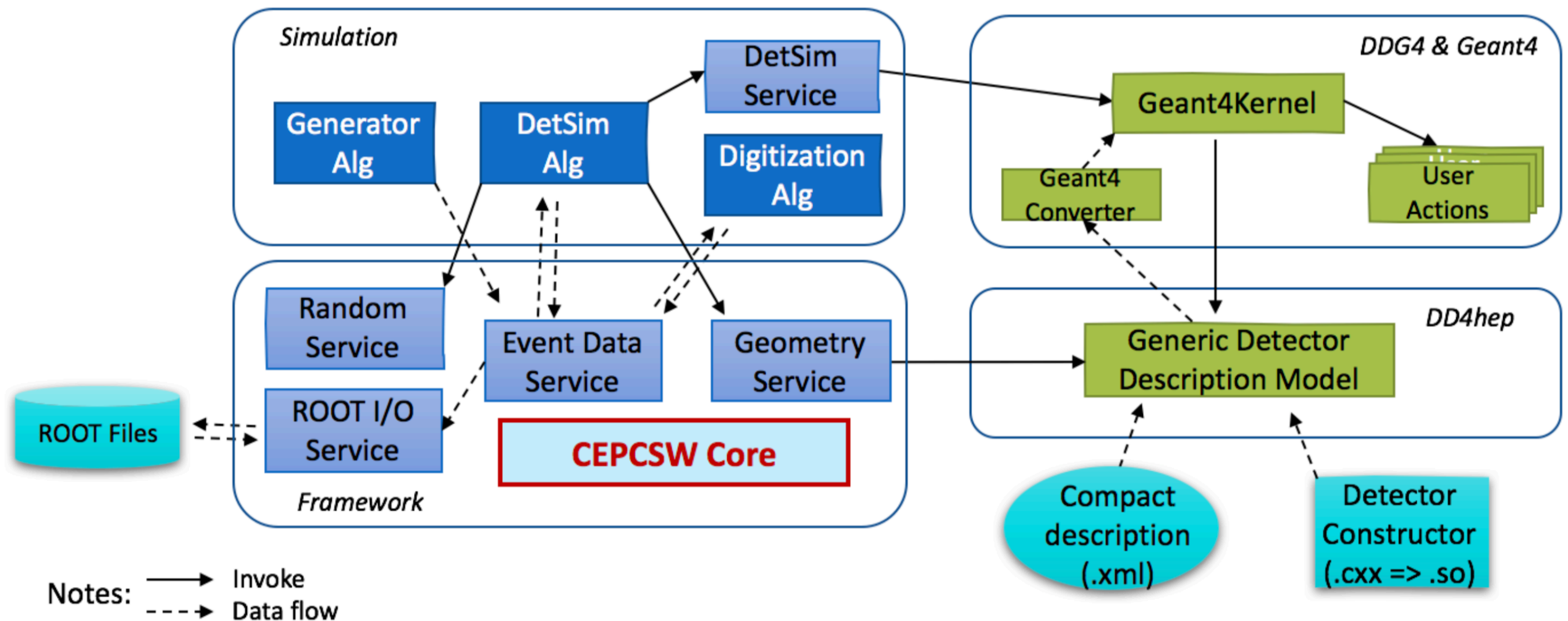


Pursue a more modern and powerful software for a real experiment !

A new framework

- lightweight and more flexible

Starts from SNiPPer or Gaudi?



New Framework Prototype Plan

- ◆ Investigate and design Kernel part of CEPC new Framework
 - ⇒ Based one of current one or not?
- ◆ Develop ROOT-based Event Data Model & I/O
 - ⇒ Similar interface as LCIO EDM.
- ◆ Develop Backward Compatible Input System
 - ⇒ Read existing simulated samples during the migration.
- ◆ Develop Unified Geometry System for Sim/Rec/Ana
 - ⇒ DD4hep
- ◆ Integrate and migrate the existing codes
 - ⇒ Simulation/Reconstruction/Analysis algorithms
- ◆ Design integration interfaces with new technologies
- ◆ Conduct performance testing and give advices for the final CEPC framework

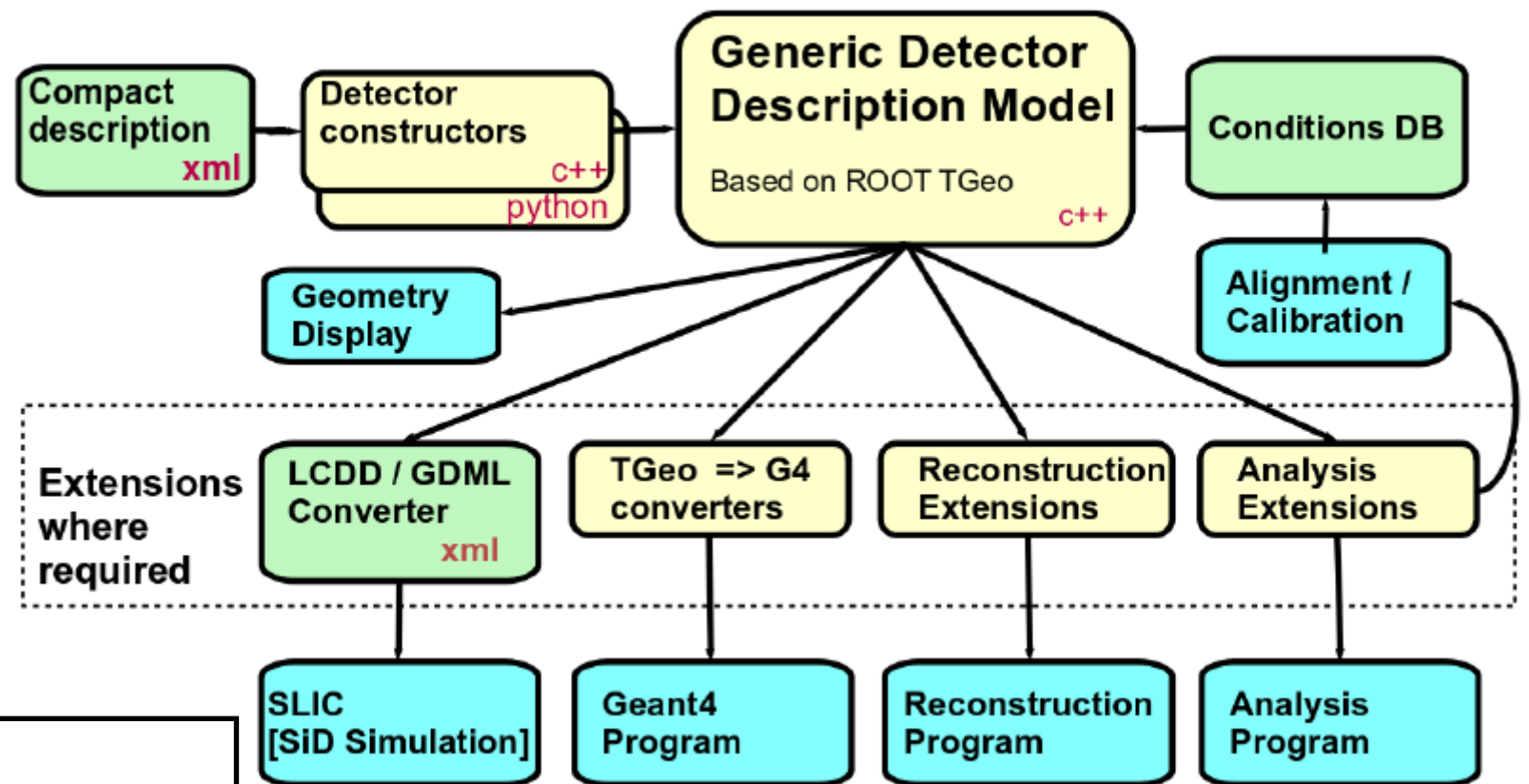
Workshop at Bologna

- A fruitful workshop
- Various frameworks
- Converge to a Turnkey Software Stack (Gaudi)
- Weidong is one of the facilitators

14:00	→ 14:15	Introduction and motivation Speaker: Paolo Giacomelli (BO) Software-workshop...	🕒 15m	📍 Sala riunioni Biomedica II piano
14:15	→ 14:45	Software status of the LHC experiments Speaker: Tommaso Boccali (PI) Future Colliders Bol...	🕒 30m	📍 Sala riunioni Biomedica II piano
14:45	→ 15:15	ILC software Speaker: Frank Gaede (DESY) gaede_ilcsoft_futur...	🕒 30m	📍 Sala riunioni Biomedica II piano
15:15	→ 15:45	FCC software Speaker: gerardo ganis (CERN) FCC-Software-Final...	🕒 30m	📍 Sala riunioni Biomedica II piano
15:45	→ 16:15	Coffee break	🕒 30m	📍 Sala riunioni Biomedica II piano
16:15	→ 16:45	CEPC software framework Speaker: Xingtao Huang (SDU) 201906_CEPC_Italy...	🕒 30m	📍 Sala riunioni Biomedica II piano
16:45	→ 17:15	Common Software tools Speaker: Graeme Stewart (CERN) Common Software ...	🕒 30m	📍 Sala riunioni Biomedica II piano
17:15	→ 17:45	Turnkey software stack vision Speaker: Andre Sailer 190612_sailer_FCS...	🕒 30m	📍 Sala riunioni Biomedica II piano
20:30	→ 23:00	Dinner		📍 Ristorante La Capriata
THURSDAY, 13 JUNE				
09:00	→ 09:30	Towards a common software stack Speakers: Dario Livio Menasce (MIB), Pere Mato (CERN), Weidong Li (IHEP) CommonSWStackR...	🕒 30m	📍 Sala riunioni Biomedica II piano

DD4HEP at CEPC by Chengdong

- CEPC_v4 implemented
- A unique geometry description for sim/rec and analysis



Usage

- environment
 - `source /cvmfs/cepc.ihep.ac.cn/software/cepcsoft/x86_64-sl6-gcc49/standby/DD4hep/01-09/env_all.sh`
 - `source /besfs/groups/higgs/users/fucd/lcgeo/bin/thislcgeo.sh`
- run
 - `ddsim steeringFile.py`

A Common Tracking Software (Acts)

Latest release: v0.10.03

Introduction

Mailing list

Repository structure

acts-core

acts-fatras

acts-data

acts-framework

Releases

History

License and authors

A Common Tracking Software (Acts)



1. [Introduction](#)
2. [Repository structure](#)
3. [Releases](#)
4. [License and authors](#)

**DD4HEP ready to use
full silicon design could be first option
TPC is next**

Latest release: v0.1

17 Jul 2019

- [Download](#)
- [Release Notes](#)
- [Documentation](#)

ACTS CEPC

- ✓ CEPC Geometry
- ✓ Run Fatras
- Test the new material mapping method
- Run the Kalman Fitter Test

Working group: Jin Zhang, Yubo Han, Hongbo, Linghui, Liangliang, Ziyang, Shengseng, ...

Hit level fast simulation tool

- Use fastras (fast tracker simulation:based on a simplified geometry description and particle-material interaction model) +
- parameterized calorimeter or frozen showers (a shower library)
- Ziyang, Gang, ... not really started yet

A few new calorimetry designs since March workshop

- Better EM resolution: cristal
- Timing, ...
- Hang + Chunxiu, et al, woking on it ...

Summary

- Many aspects : geometry, framework, EDM, fast simulation, common reconstruction package(s), etc
- Fast simulation is first priority: fast iteration, white paper ...
- A usable new framework is the key now
- But lack of manpower: framework, fastsim, tracking, ...