ILC Testbeam software
(Marlin et al)

F.Gaede, DESY

LCTW09 2nd preparatory Meeting

July, 17 2009

Outline

- the ILD &testbeam (EUDET) software framework

- LCIO – data model and persistency

- Open points

- Concluding remarks & Outlook

The ILD software framework

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- **Mokka** (LLR)

  - geant4 simulation application

- **LCIO** (DESY/SLAC)

  - international standard for persistency format / event data model

- **Marlin**

  details at **http://ilcsoft.desy.de**

  - core application framework for reconstruction & data analysis
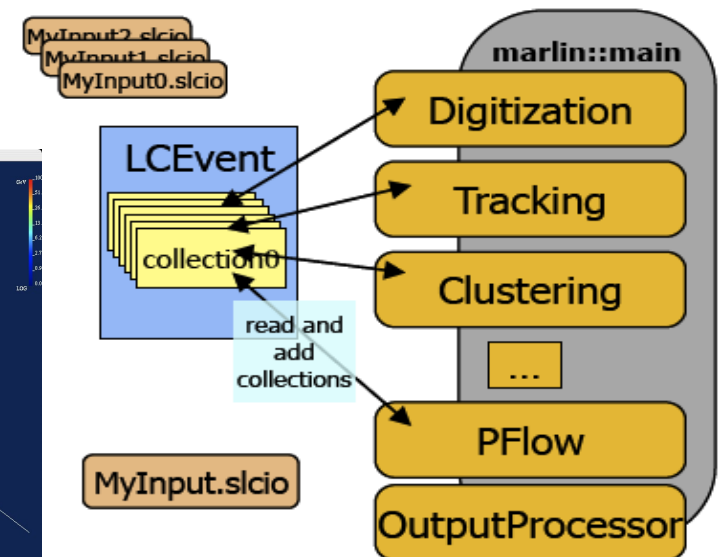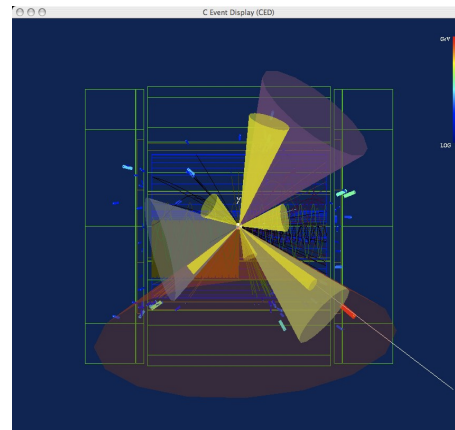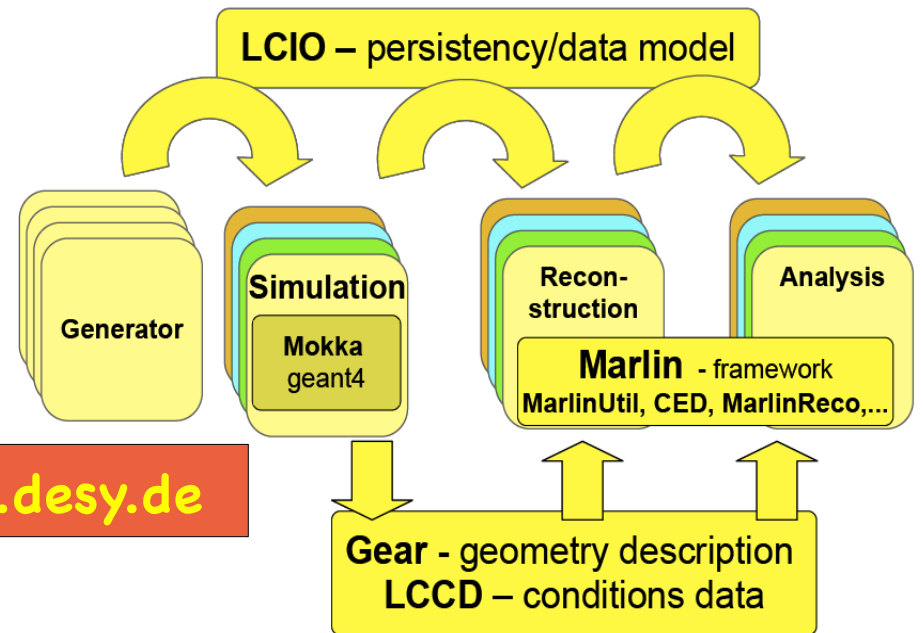
- **GEAR**

  - geometry package f. reconstruction

- **LCCD**
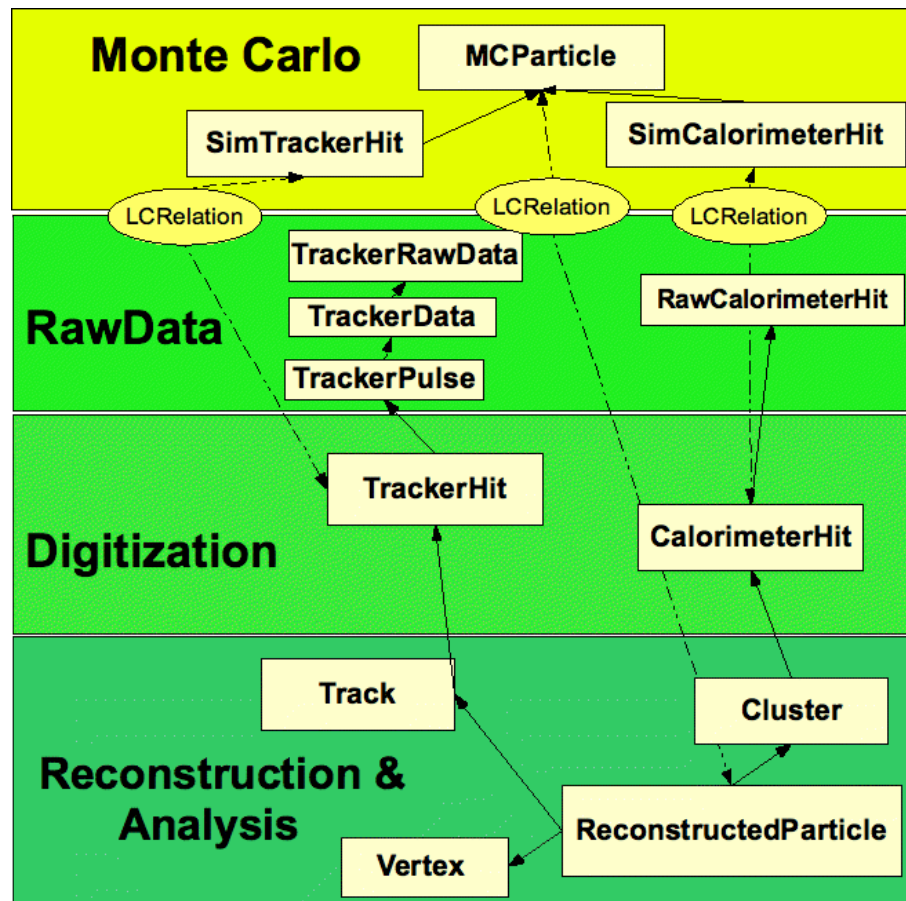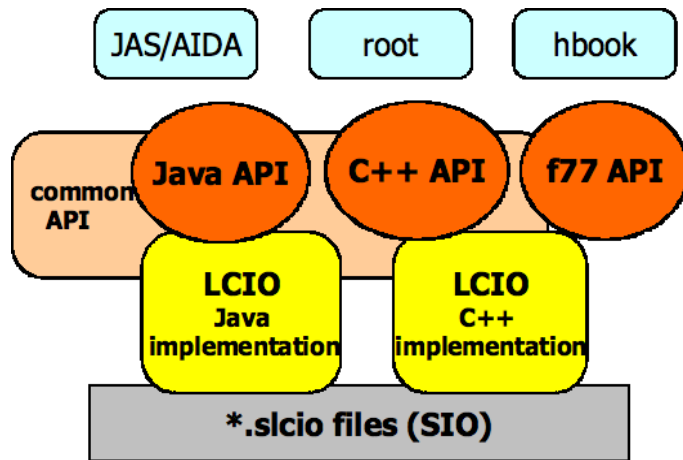
  - conditions data toolkit (DB)

- **CED**

  - 3d event display

LCIO – persistency/data model

Generator | Simulation (Mokka geant4) | Recon-struction | Analysis

Marlin - framework MarlinUtil, CED, MarlinReco,...

Gear - geometry description
LCCD – conditions data

C Event Display (CED)

MyInput2.slcio
MyInput1.slcio
MyInput0.slcio

LCEvent
collection0

marlin::main
Digitization
Tracking
Clustering
...
PFlow
OutputProcessor

read and add collections

MyInput.slcio

LCIO: persistency & event data model

- **joined DESY and SLAC project** – first presented @ CHEP 2003

- provides **persistency (I/O)** and an **event data model** to ILC detector R&D community

- features:
  - Object I/O (w/ pointer chasing)
  - schema evolution
  - compressed records
  - hierarchical data model
  - **decoupled from I/O by interfaces**
    - **C++, Java (and Fortran)**
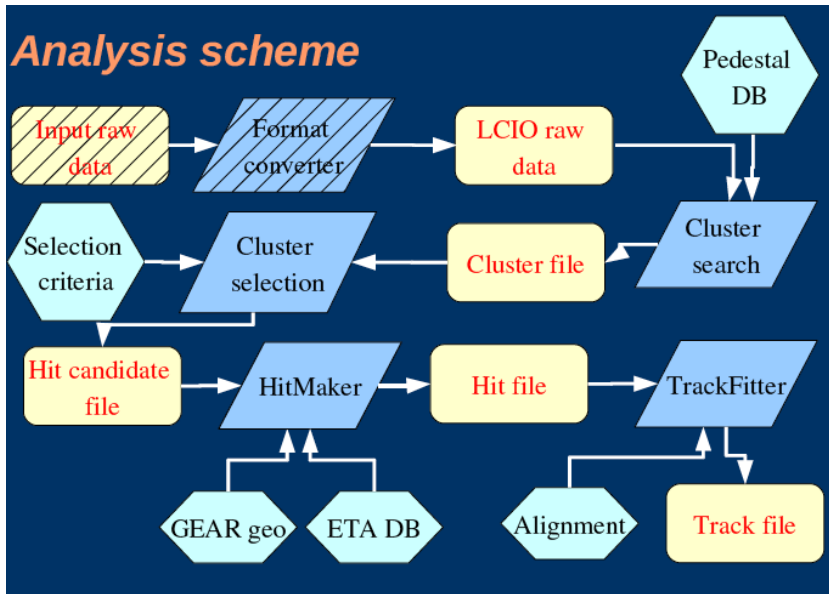 - some generic user object I/O

LCIO is used by ILD, SID, Calice, EUPixelTelescope, LCTPC,...

ILC testbeams using the framework

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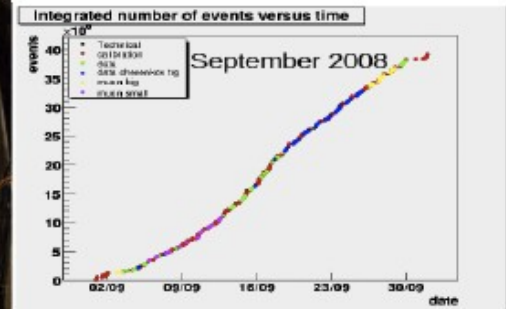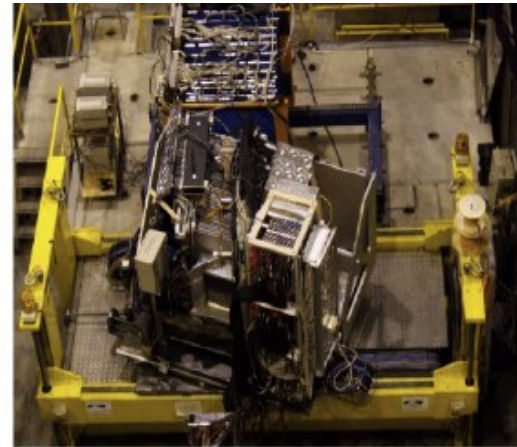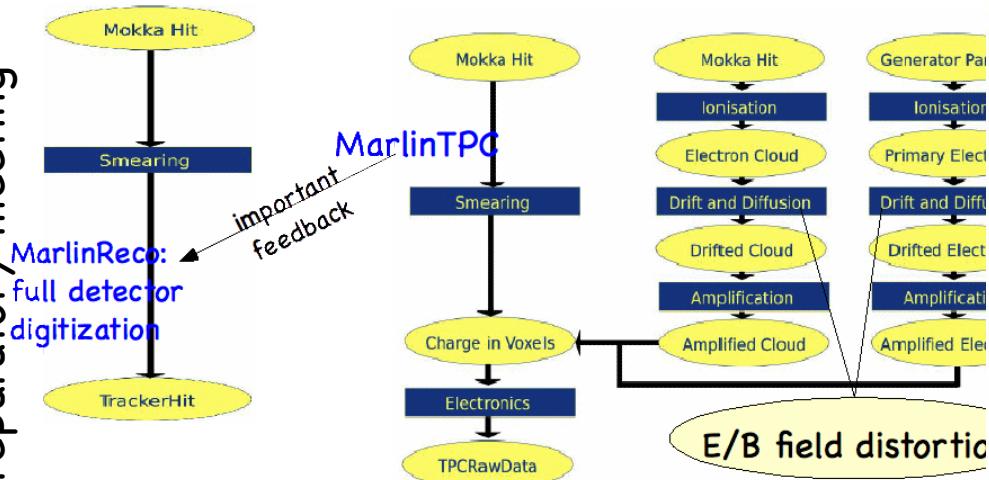
>300 Mio events
~40 TB (incl.MC/processed)

- complete framework used for ILD detector optimization and also for EUDET testbeam experiments :

- **CALICE**

- **LCTPC (MarlinTPC)**

- **PixelTelescope (EUTelescope)**

- synergies from using the same framework for testbeam and large detector studies

Open issues – software I

- are the current software tools appropriate for the upcoming test beam campaigns ?

- need to understand needs of the different R&D communities,.e.g.

  - is LCIO well suited as the only file format ?

  - do we need additional features, such as split files, streaming of user objects ?

  - other requirements for LCIO ?

  - in the case LCIO would be extended to also use ROOT I/O (under investigation) would the test beams switch ?

Open issues – software II

- are there any software tools common to all test beams that could/should be developed ?

  - common event display ?

    - several independent solutions exist for testbeams

  - DAQ software ?

    - monitoring

    - event building

    - data flow

  - improve conditions data base ?

    - LCCD exists (used by Calice and others) – but based on outdated CondDBMySQL

  - ...

Concluding remarks & Outlook

- having a common frameworks for the different testbeams and the global ILD detector studies provides synergies for both communities

  - easy to switch between tasks as toolset is known
  - fast feedback of R&D results into global detector design

- made possible through EUDET project (funding for manpower & communication platform)

- ILD/ILC software development is still a limited effort

  - identified ambitious task list for ILD software (TDR2012 !)

  - -> what can be accomplished wrt. new common software tools for testbeams very much depends on the effort (manpower) that is available (successor to EUDET!?)

- learn what's needed and possible @ LCTW09