LCIO

Overview and Status

ECFA Workshop, Montpellier
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Outline

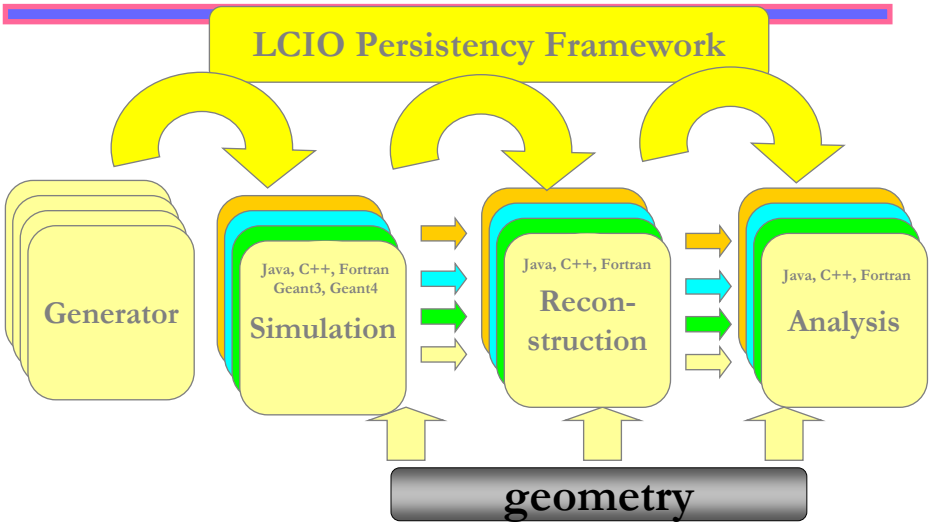
- Introduction
- Data model
- Software design
- Implementation
- Status/Features
- Customers/Users
- Summary

Introduction

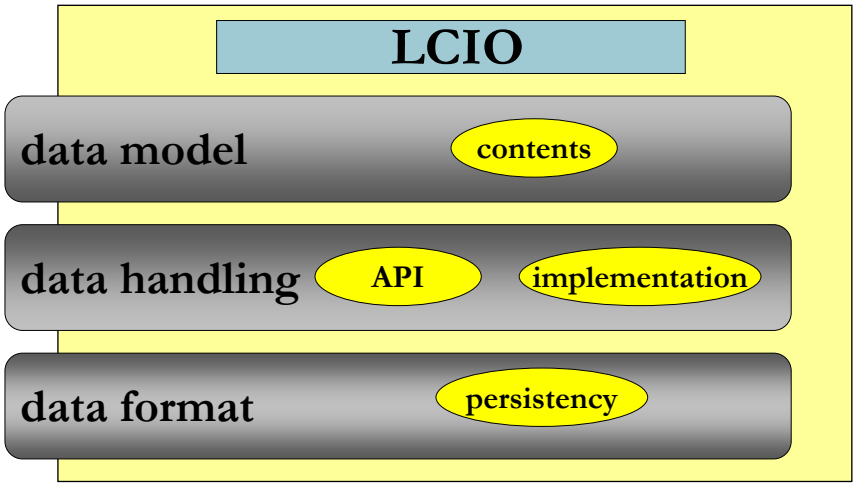
- at Prague workshop decided to have
  Data format/persistency task force:
  "Define an abstract object persistency layer and a data model for linear collider simulation studies until the Amsterdam workshop."

- -> **LCIO** – Linear Collider Input/Output
  - DESY/SLAC/LLR joined project
  - design of data model and software introduced at Amsterdam workshop
  - now production version

Motivation for LCIO



LCIO persistency framework

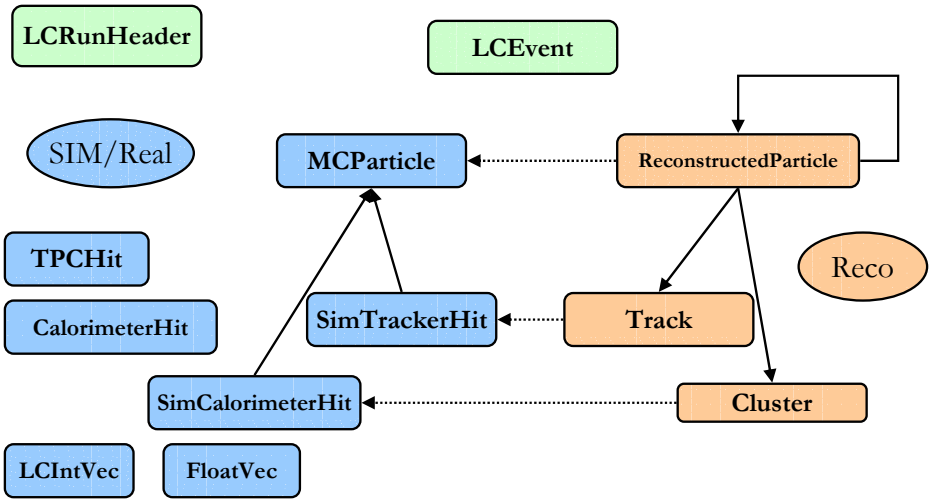


Requirements

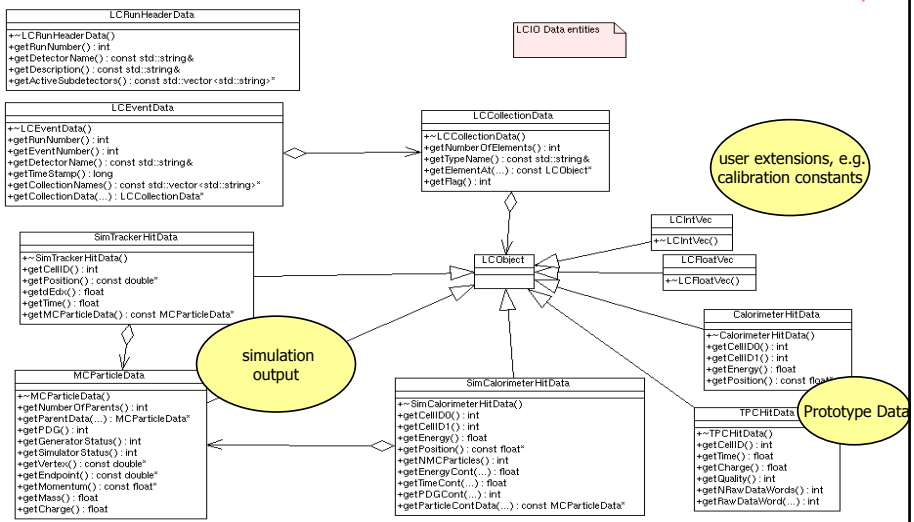
- need Java, C++ and f77 (!) implementation
- extendable data model for current and future simulation studies
- user code separated from concrete data format
  - -> want to be flexible for future decisions on persistency
- needed a.s.a.p.

  -> keep it simple (lightweight)

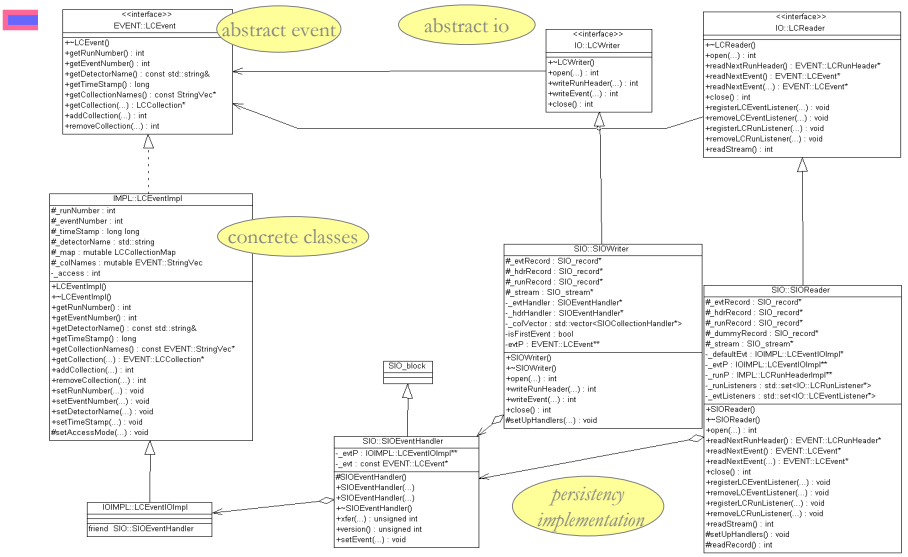
LCIO Datamodel



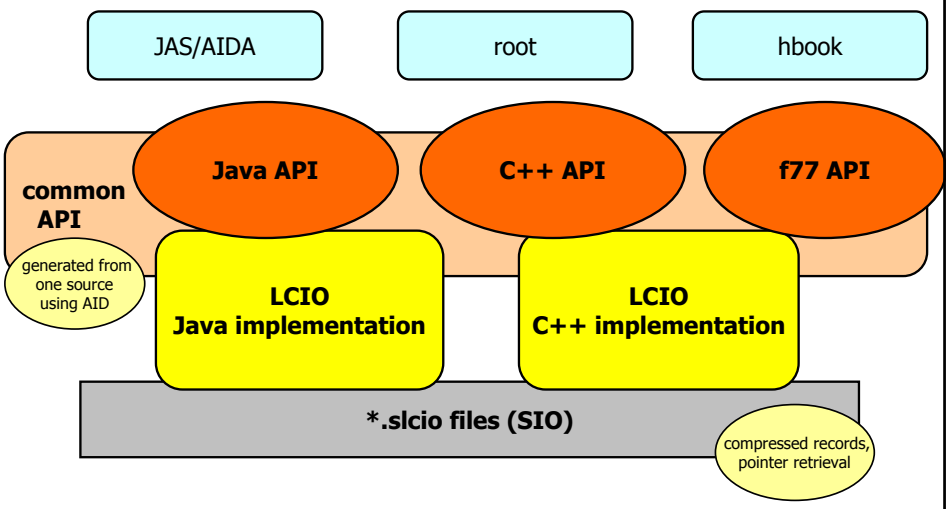
Data model - Design



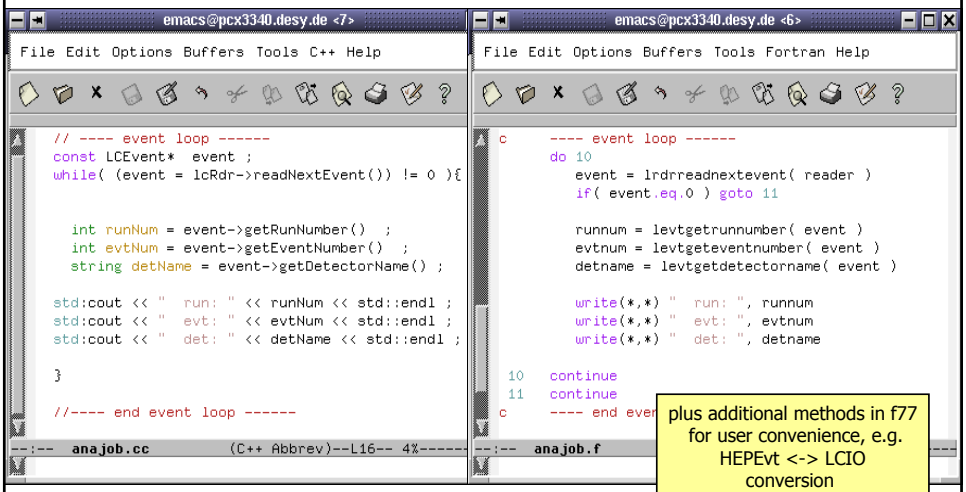
Implementation - Design



LCIO SW-Architecture



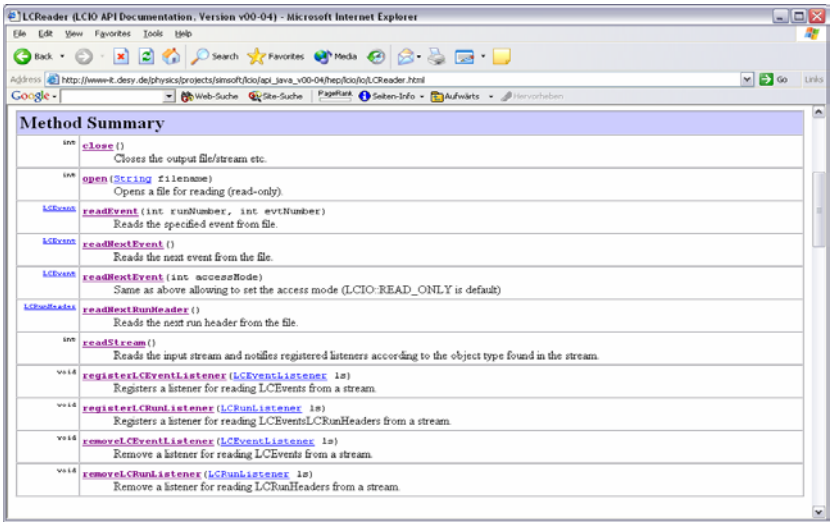
C++ and f77 example code



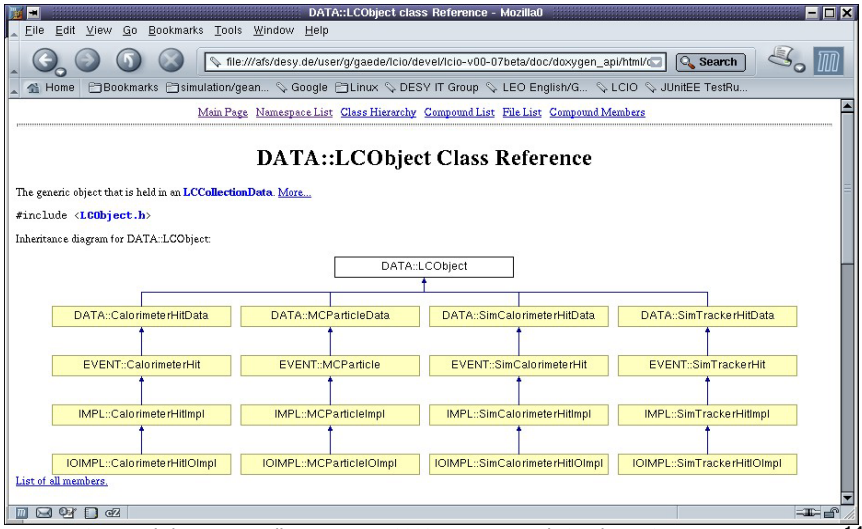
LCIO Status

- production version 1.0 released:
  - C++, Java, f77 complete for simulation data
    - and generator data (HEPEvt<->LCIO)
  - simple example code for all languages
  - 'real world' examples (JAS3, root, hbook)
  - documentation
    - users manual
    - API documentation HTML (javadoc, doxygen)
  - available for download via CVS
  - linux (gcc), windows (cygwin)
- schema evolution from now on (reading old files)
- API stable (only extensions)

Javadoc example



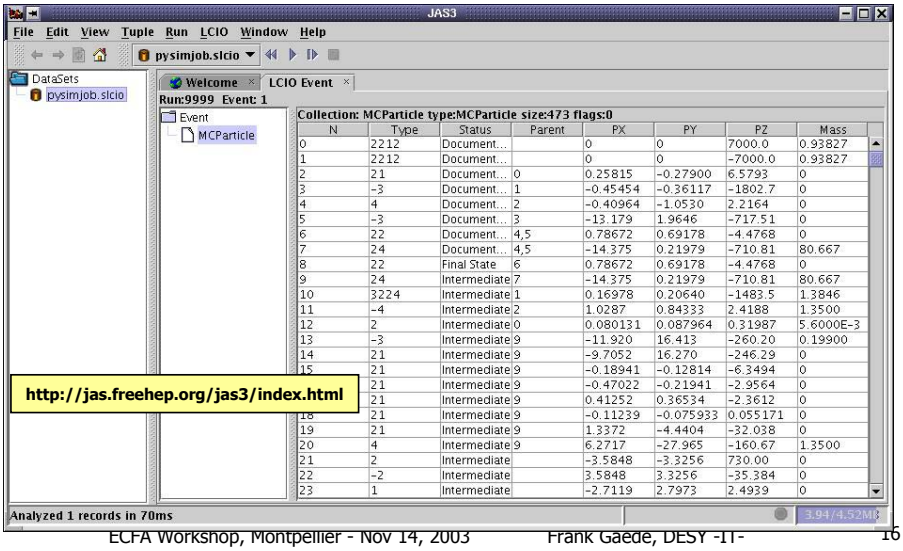
Doxygen example



LCIO Customers/Users

- Mokka simulation (v08-00)
  - update to v01-00 within ~1 week
- Brahms reconstruction
  - under development (H.Vogt)
    -> to be release in ~2 weeks
- JAS3
  - provides convenient file browser
  - will have LCIO-WIRED plugin
    -> generic event display !
- Calorimeter group (DESY)
  - will convert MiniCal raw data to LCIO files
  - to be used also for HCalPPT
- TPC groups (DESY & LBNL?)
  - will use LCIO for prototype
- other groups looking into using LCIO

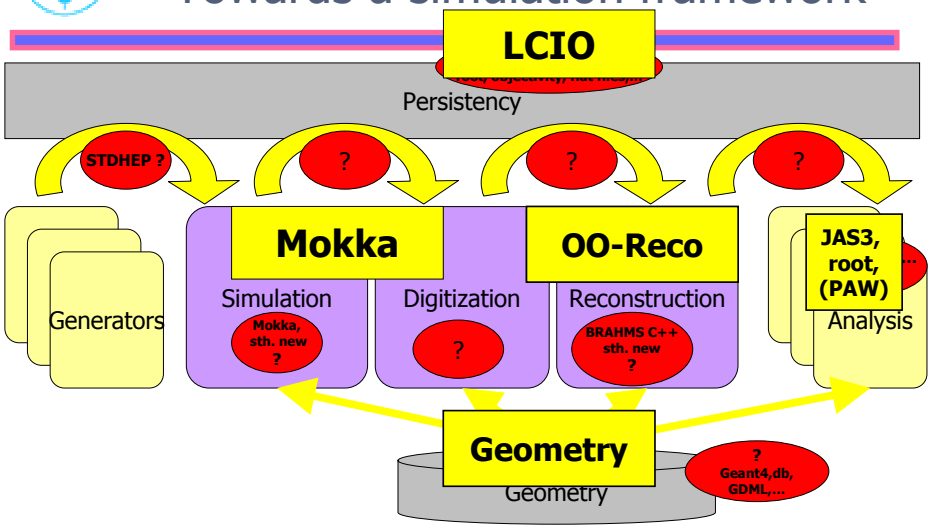
JAS3 – LCIO file browser



Future developments

- implement reconstruction data model
- add convenient methods
  - looping over MCParticles
  - analyzing parent/daughter relationships
  - ...
- add possibility to store more generic user data (calibration constants etc.)
- respond to user requests

Towards a simulation framework



Summary

- LCIO, a persistency framework for the LC:
  - Java, C++ and f77 user interface
  - Java and C++ implementation
  - data model for simulation and prototype data
    - reconstruction soon to follow
- production version released (1.0)
- used by several groups and tools
  - others invited to join !
- see LCIO homepage for more:

http://www-it.desy.de/physics/projects/simsoft/lcio/index.html