# Some considerations about analysis software framework for EUDET pixel beam telescope
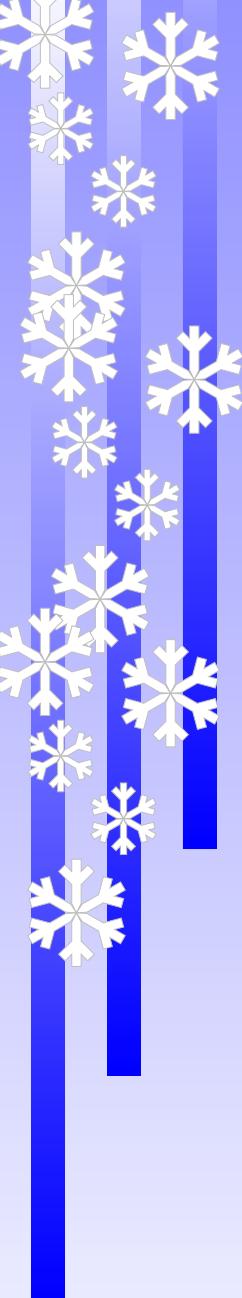
**JRA1 Software meeting, 19 December 2006.**

**Tatsiana Klimkovich**

**DESY**

# Contents
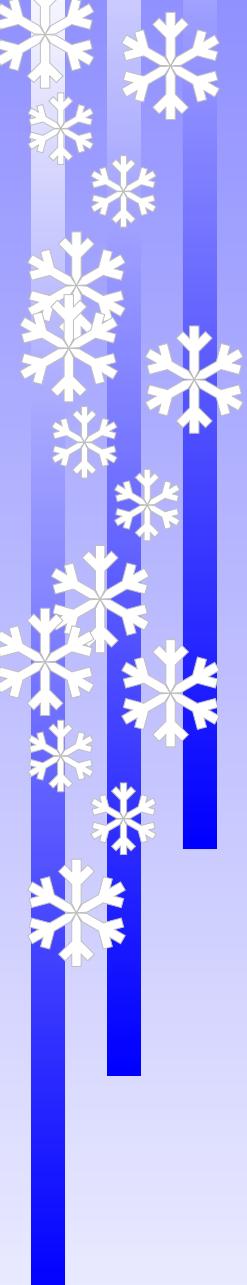
- ✓ cvs repository
- ✓ Recommendations from ILC software developers
- ✓ Detector geometry description
- ✓ Proposals for next JRA1 software meeting

# cvs repository

✓ Will be created within ILC software repository

✓ Name of the repository (lowercase):

  ★ My proposal: "eutelescope"

  ★ Filip's proposal: "eutelanal"

  ★ Antonio's proposal: "eutrack"

  ★ Your proposal ?

✓ Possibility to create several directories

✓ Web interface will be available (for reading the last version of the package). See example of TPC repository "marlintpc":
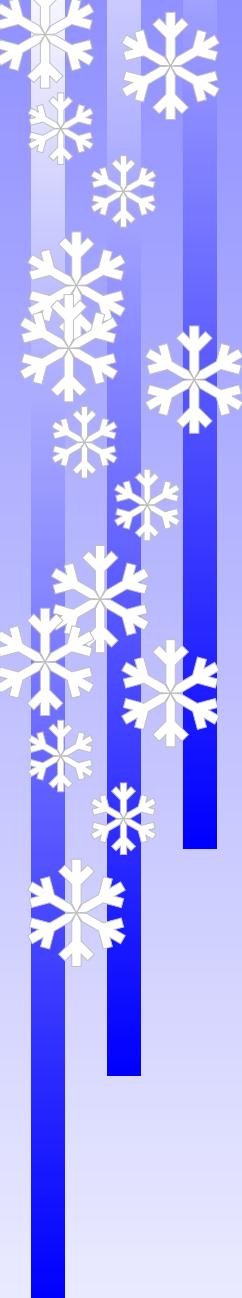
`http://www-zeuthen.desy.de/lc-cgi-bin/cvsweb.cgi/`

`MarlinTPC/?cvsroot=marlintpc`

✓ List of people developing the code ?

# Recommendations from ILC software developers

Frank Gaede (leader of ILC software development at DESY):

- ✓ Incourages to use ILC software

- ✓ Proposes close collaboration between ILC software developers and JRA1 analysis software and DAQ developers

- ✓ If some new development is needed he is ready to help

- ✓ Would like to participate in DAQ and analysis software meetings in January

# Why should we use ILC software?

- ✓ Useful experience for vertex detector R&D

- ✓ Stick to common standards

- ✓ Convenient for other users

- ✓ Easy to combine with Mokka simulation

- ✓ TPC and Calice are already using this software

- ✓ Some experince among vertex community already exists (Marco Battaglia)

- ✓ Should go one step further in comparison with Calice (see later)

# LCCD

## Frank Gaede talk in München:

LCCD

**L**inear **C**ollider **C**onditions **D**ata Toolkit

Frank Gaede, EUDET-Annual Meeting, MPI Munich, Oct. 18-20, 2006

- Reading conditions data
  - from conditions database
  - from simple LCIO file
  - from LCIO data stream
  - from dedicated LCIO-DB file
- Writing conditions data
- tag conditions data
- Browse the conditions database
  - through creation of LCIO files
    - vertically (all versions for timestamp)
    - horizontally (all versions for tag)

Reconstruction/Analysis Application

LCCD

DBinterface

CondDB API

LCIO
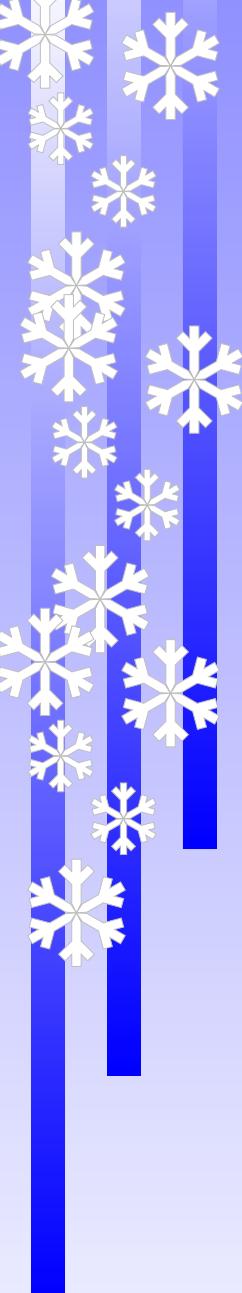
CondDBMySQL

cond_tag1.slcio

MySQL

LCCD is used by Calice for the conditions data of the ongoing testbeam studies

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# GEAR

## Frank Gaede talk in München:



**Gear**
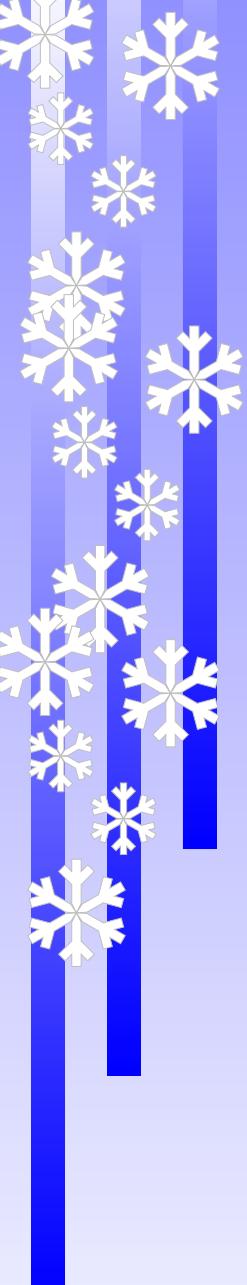
**GE**ometry **A**PI for **R**econstruction

- well defined geometry definition for reconstruction that
  - is flexible w.r.t different detector concepts
  - has high level information needed for reconstruction
  - provides access to material properties
- abstract interface (a la LCIO)
- concrete implementation based on XML files
- and Mokka-CGA

Frank Gaede, EUDET-Annual Meeting, MPI Munich, Oct. 18-20, 2006

```
- <gear>
  - <!--
      Example XML file for GEAR describing the LDC detector
    -->
  - <detectors>
    - <detector id="0" name="TPCTest" geartype="TPCParameters" type
        <maxDriftLength value="2500."/>
        <driftVelocity value=""/>
        <readoutFrequency value="10"/>
        <PadRowLayout2D type="FixedPadSizeDiskLayout" rMin="386.0"
        maxRow="200" padGap="0.0"/>
        <parameter name="tpcRPhiResMax" type="double"> 0.16 </para
        <parameter name="tpcZRes" type="double"> 1.0 </parameter>
        <parameter name="tpcPixRP" type="double"> 1.0 </parameter>
        <parameter name="tpcPixZ" type="double"> 1.4 </parameter>
        <parameter name="tpcIonPotential" type="double"> 0.00000003
      </detector>
    - <detector name="EcalBarrel" geartype="CalorimeterParameters">
        <layout type="Barrel" symmetry="8" phi0="0.0"/>
        <dimensions inner_r="1698.85" outer_z="2750.0"/>
        <layer repeat="30" thickness="3.9" absorberThickness="2.5"/>
        <layer repeat="10" thickness="6.7" absorberThickness="5.3"/>
      </detector>
    - <detector name="EcalEndcap" geartype="CalorimeterParameters">
        <layout type="Endcap" symmetry="2" phi0="0.0"/>
        <dimensions inner_r="320.0" outer_r="1882.85" inner_z="2820.
        <layer repeat="30" thickness="3.9" absorberThickness="2.5"/>
        <layer repeat="10" thickness="6.7" absorberThickness="5.3"/>
      </detector>
  </detectors>
</gear>
```

compatible with US – compact format

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# GEAR

**Frank Gaede talk in München:**
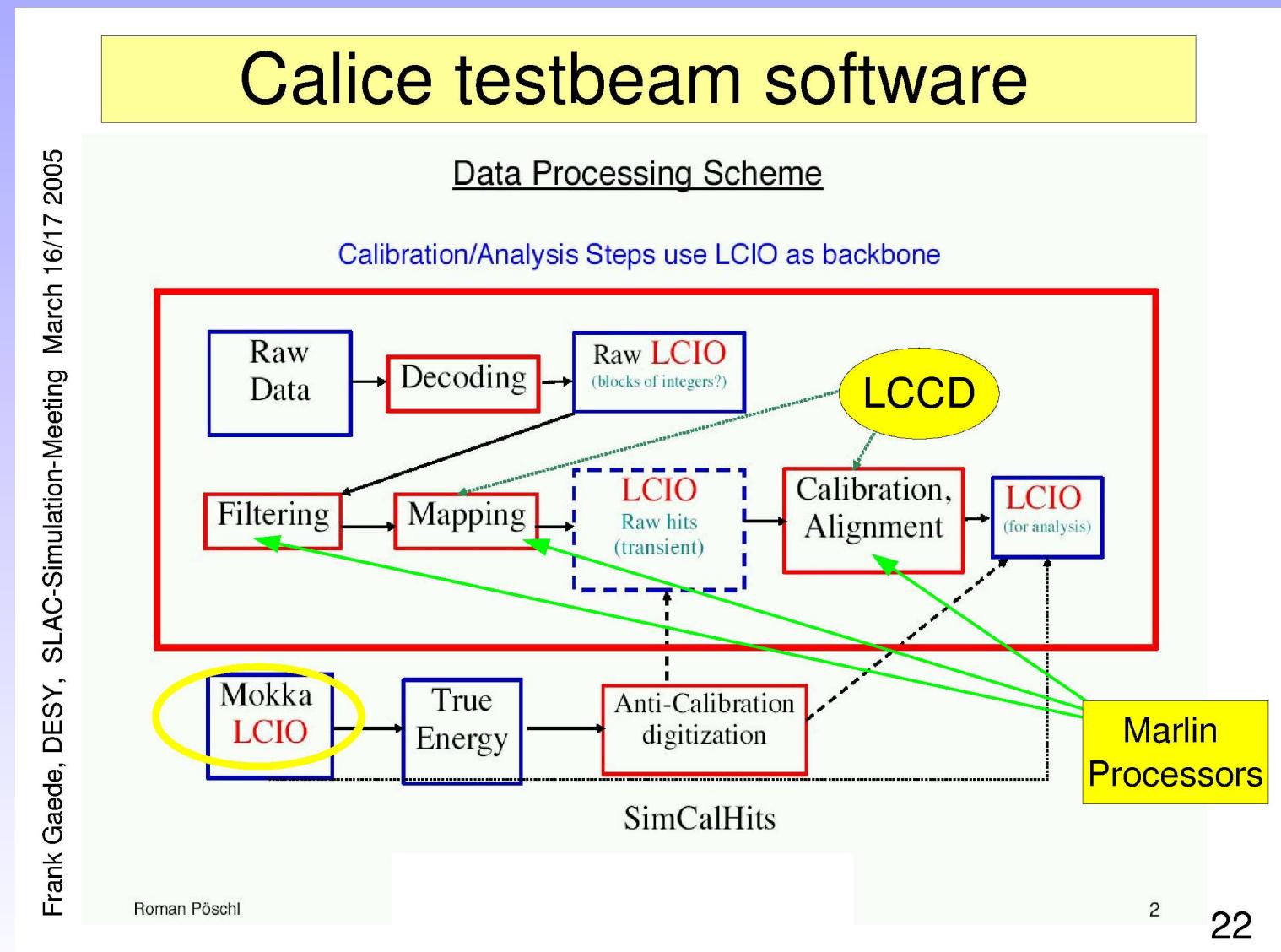
## Gear status

- version v00-03
  - main detectors: TPC, Hcal, Ecal and VXT (new) interfaces defined and implemented
  - \+ free form user parameters for other detectors
  - description of TPC prototypes (rectangular pad plane)
  - description of calo prototype
- GearCGA (Mokka/geant4) - material properties
  - detailed material properties for every point (and distance)
- related work: MokkaGear
  - extract geometry information in Mokka drivers when detector is built in memory for simulation
  - use Gear to create XML files for reconstruction
  - -> have only one source of geometry information

Frank Gaede, EUDET-Annual Meeting, MPI Munich, Oct. 18-20, 2006

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# Calice experience

**Frank Gaede talk in München:**
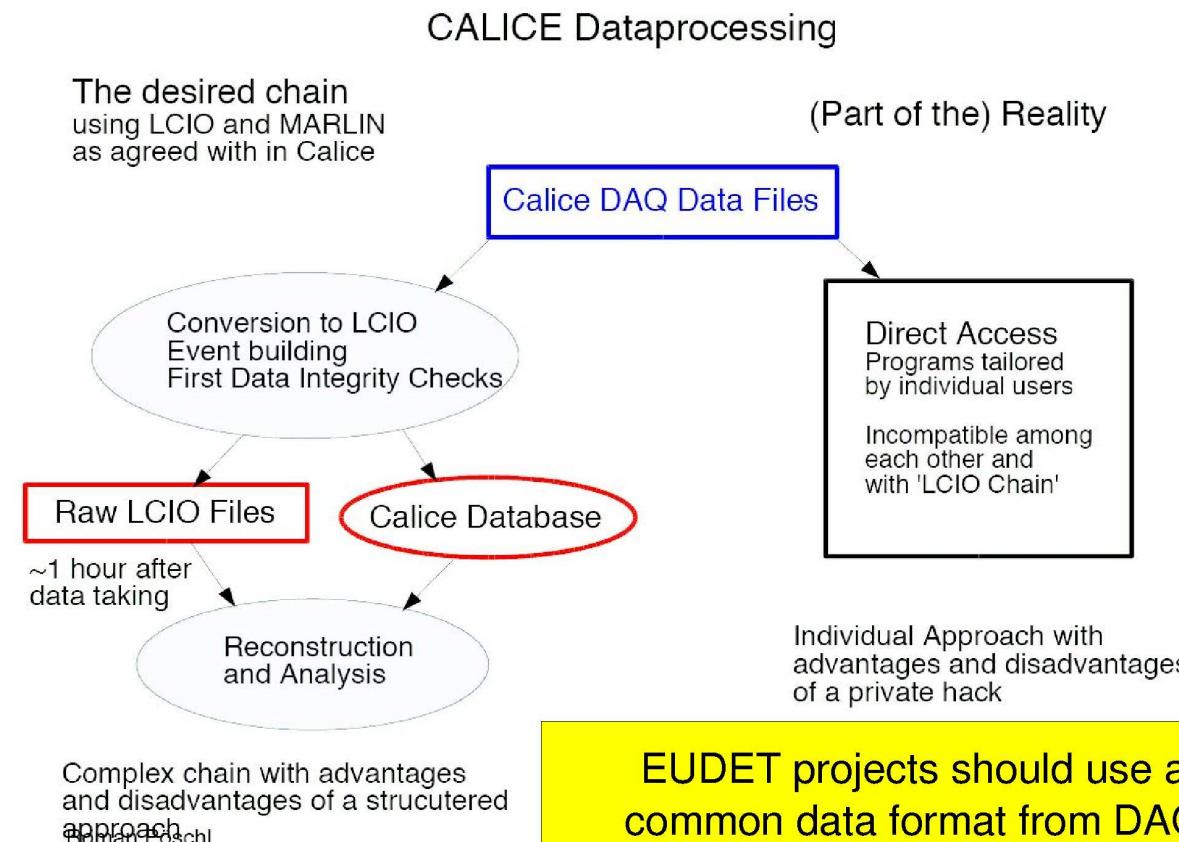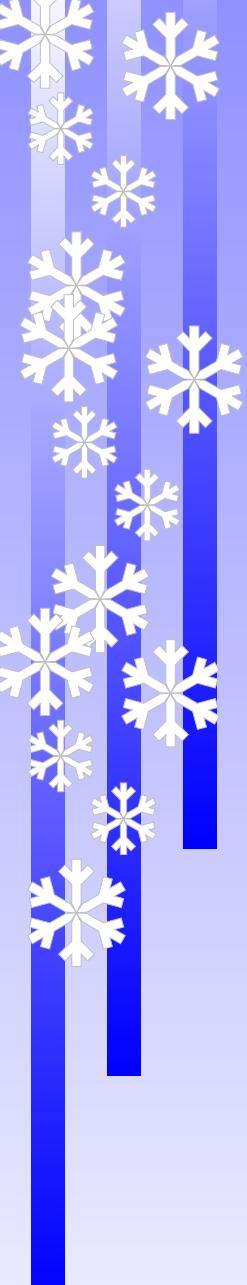
# Calice experience

**Frank Gaede talk in München:**



## Problems with having two data formats

**CALICE Dataprocessing**

Frank Gaede, EUDET-Annual Meeting, MPI Munich, Oct. 18-20, 2006

The desired chain
using LCIO and MARLIN
as agreed with in Calice

(Part of the) Reality

Calice DAQ Data Files

Conversion to LCIO
Event building
First Data Integrity Checks

Direct Access
Programs tailored
by individual users

Incompatible among
each other and
with 'LCIO Chain'

Raw LCIO Files        Calice Database

~1 hour after
data taking

Reconstruction
and Analysis

Individual Approach with
advantages and disadvantages
of a private hack

Complex chain with advantages
and disadvantages of a strucutered
approach
Roman Pöschl

**EUDET projects should use a
common data format from DAQ
to analysis - LCIO**

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# Proposals for next JRA1 software meeting

✓ Invite Frank Gaede and Roman Pöschl (Calice) to our next meeting

✓ Contact of DAQ developers with Frank (data format discussions)