CALICE Software Framework
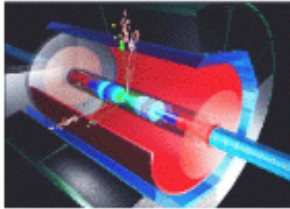
Roman Pöschl
DESY Hamburg
CALICE Collaboration

JRA3/CALICE Testbeam Requirements

EUDET NA2 Meeting
CERN
14/12/05

The collaboration

190 physicists/engineers from 32 institutes and 9 countries
Coming from the 3 regions (America, Asia and Europe)

CALICE is an open - and growing - collaboration:
Recently new groups from Canada, France, Korea, the UK, the USA

- Sharing of tasks and resources

- Organizational structure and procedures defined in a "Memorandum of Agreement"

- Regular internal reviews to monitor the progress

Introduction

CALICE collaboration is preparing/performing large scale testbeam
during the coming years (~2005-2008)

Goals: Hardware Recommendation
for (central) ILC Calorimeters

Development of precise models
to describe shower development
in highly granular detectors
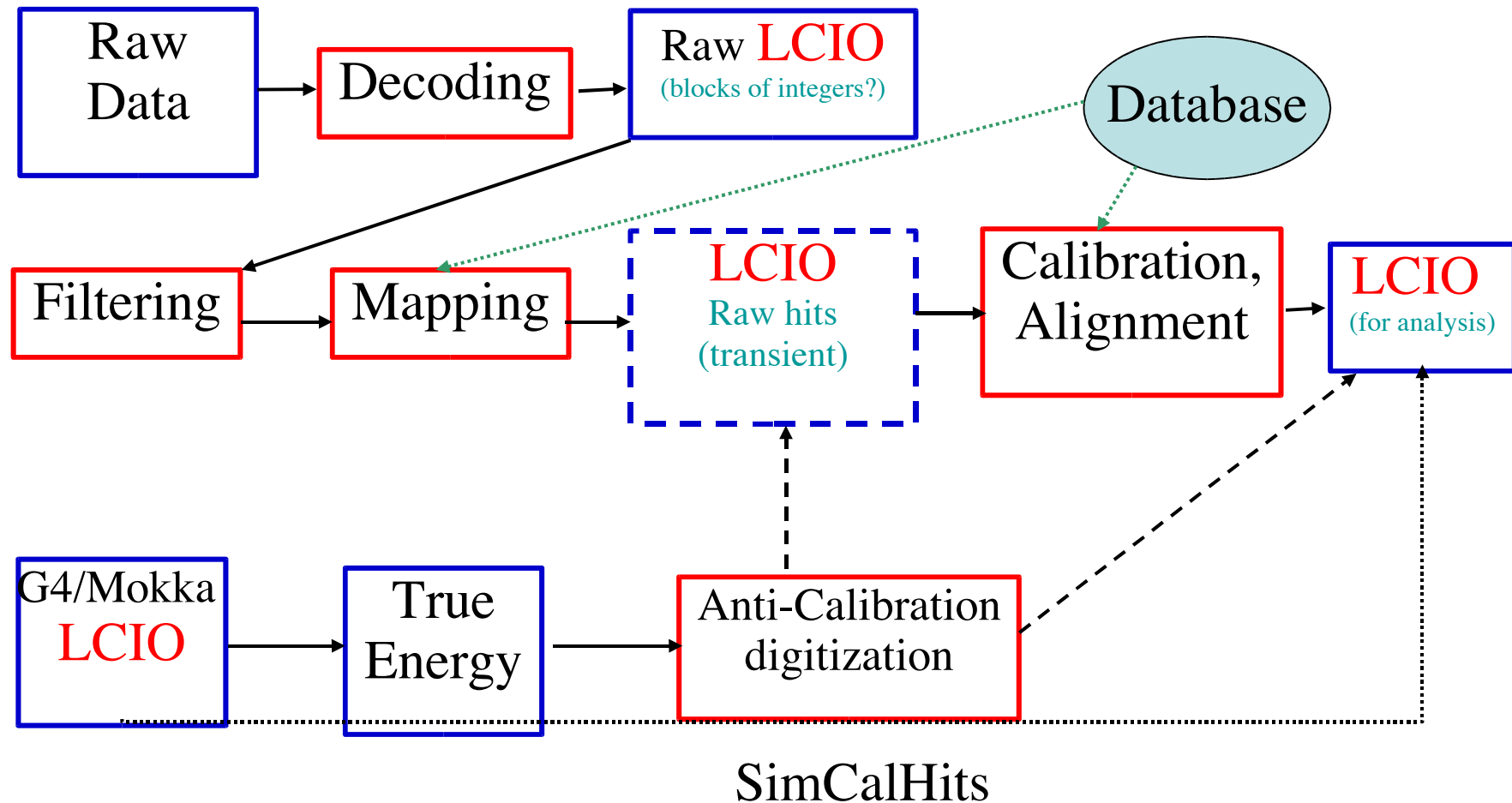$O(1x1\ cm^2)$ cell size

Testbeam program poses
software "challenges"

- Detailed simulation of testbeam
setup

- Data processing from
Raw Data to final
Clusters in
user friendly way

- Handling of Conditions Data

Drift Chambers
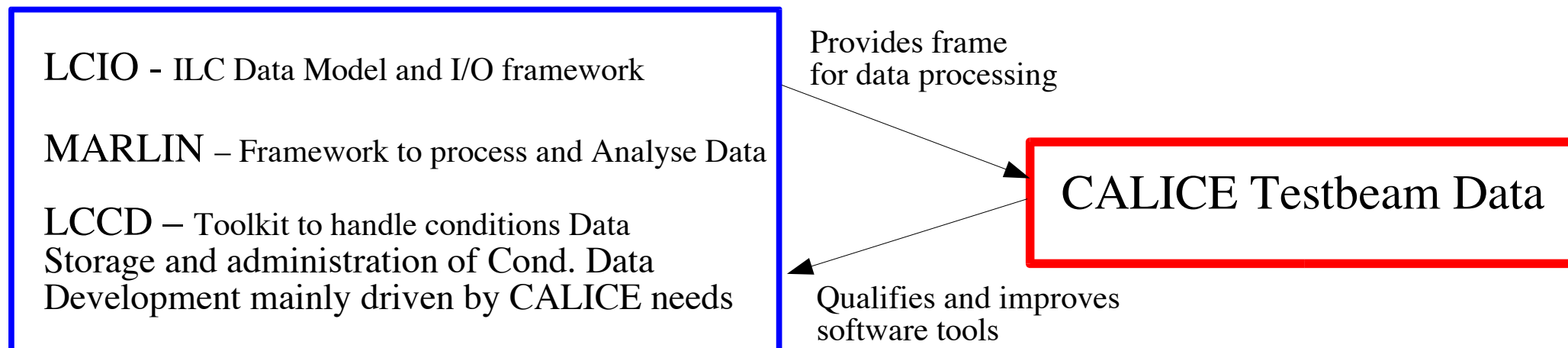
Ecal

(Tile) Hcal

"Tail Catcher"
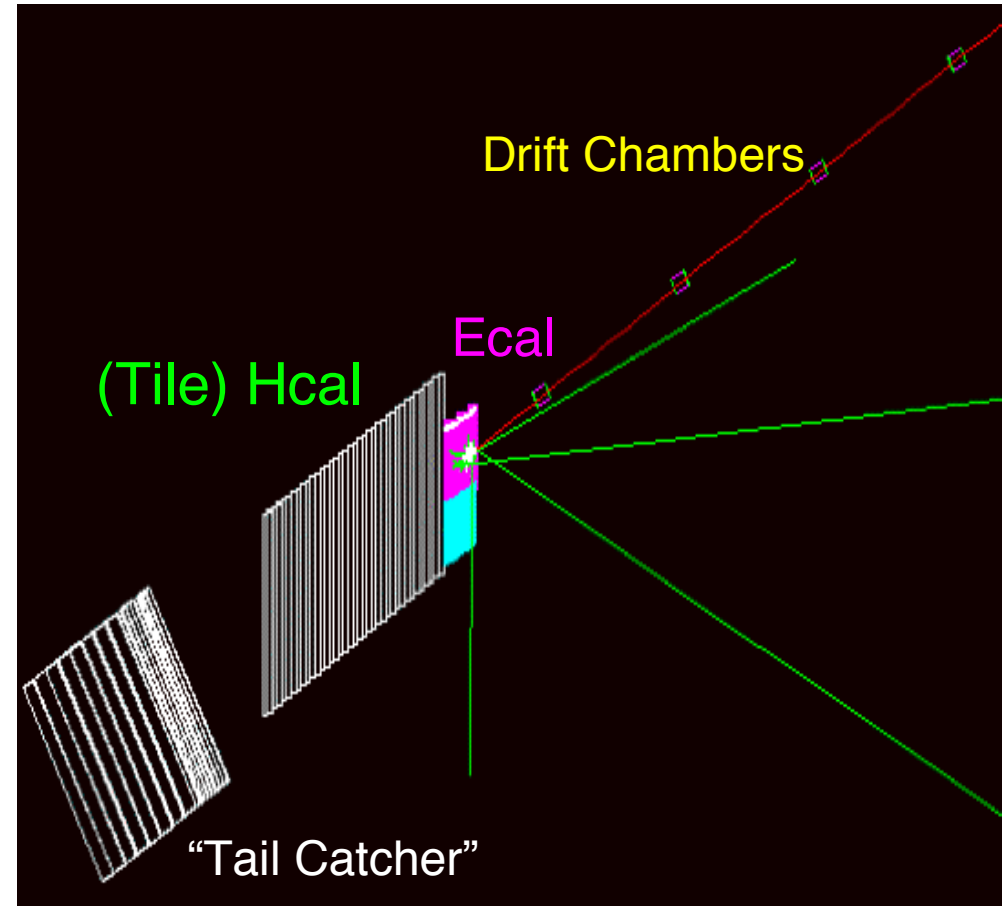
G4 based implementation of Testbeam Setup

Dataflow in CALICE Testbeam

Data processing <u>and</u> Simulation is based on ILC Software tools

Software Tools needed for Data Processing

LCIO - ILC Data Model and I/O framework

MARLIN – Framework to process and Analyse Data

LCCD – Toolkit to handle conditions Data
Storage and administration of Cond. Data
Development mainly driven by CALICE needs

Provides frame
for data processing

CALICE Testbeam Data

Qualifies and improves
software tools

CALICE 'expects'

- Continous support of data processing
  software (as nicely provided so far)
- Quick response by ILC Software developpers
  if short comings are observed

CALICE 'delivers'

- High quality testbeam data
  easily analyzable for everyone
  familiar with ILC Software tools
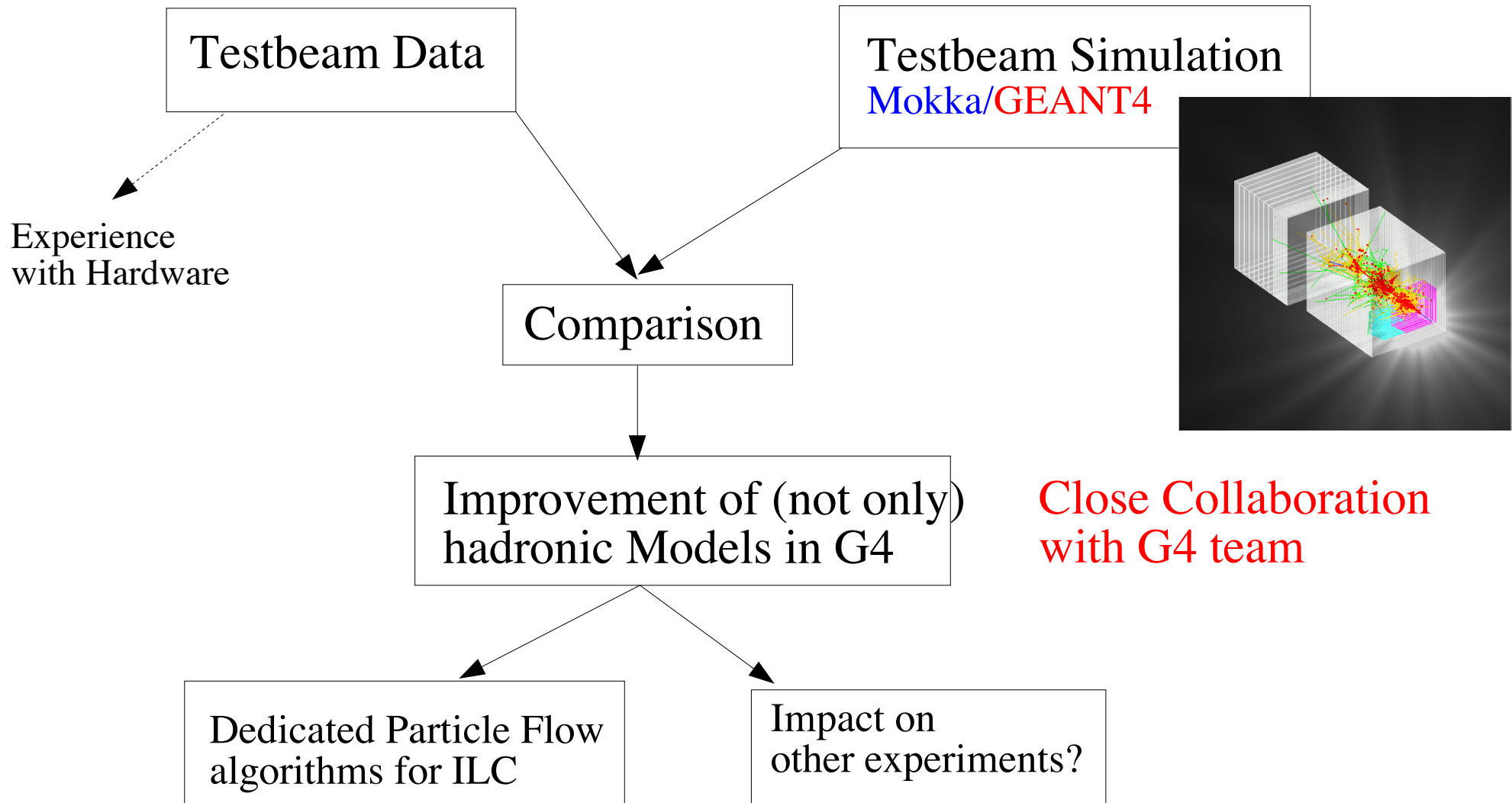- Data to be used to improve G4
  shower models

Short Term support – Data are taken as we speak

Data Storage/Access Issues

4 weeks of CALICE Ecal data taking ~ 250 Gbyte raw data
Full CALICE Data Taking will add up to ~3 Tbyte of (raw) data

- Infrastructure for mass storage setup at DESY (dCache Pool)
  Roughly 5 Pbyte diskspace available

- dCache is common effort of DESY and Fermilab !

- (Recommended) access via Grid-Tools
  Not very much experience gathered yet
  Mastering this is essential for sharing of CALICE and ILC data
  Established a VO calice hosted by DESY

- Would like to benefit/contribute from/to developments of Grid Tools
  (e.g. access to CPU power for simulation)

Testbeam Simulation et al.

Testbeam Data

Testbeam Simulation
Mokka/GEANT4

Experience
with Hardware

Comparison

Improvement of (not only)
hadronic Models in G4

Close Collaboration
with G4 team

Dedicated Particle Flow
algorithms for ILC

Impact on
other experiments?

Short, medium and long term support (throughout testbeam period and beyond)
(Started nicely for data with elm. Calorimeter – Hadronic Calo data ~ Autumn 2006)

Summary and Outlook

- **CALICE uses general ILC Software tools for data processing**
  Project would like to (will) make use of software developed
  within EUDET NA2

- **Access to computing infrastructure highly desirable**

- **Need effective means of communication to exploit testbeam data**
  as quickly as possible (travelling, [video] conferencing on short notice etc.)
  Establish communication chain, e.g. who might be our contact persons ?