

Status of EUDET NA2 - ANALYS

Common Analysis and Simulation Software

Frank Gaede
DESY
EUDET Extended Steering
Committee Meeting
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Objectives for task ANALYS

- **development of a common data analysis and simulation infrastructure**
 - development of a software framework for the exchange, analysis and comparison of test beam data
 - development of a software framework for the simulation of test beam experiments
 - creation of a repository for experimental and simulation data
 - embedding into existing GRID infrastructure
- **strategy**
 - the testbeam software effort is tightly integrated with the **overall common ILC/LDC software effort !**
 - implement tools and functionality specific to testbeams
 - benefit from synergies where possible
 - **same for grid tasks: integrate with common ILC grid activities**

Deliverables and Requirements

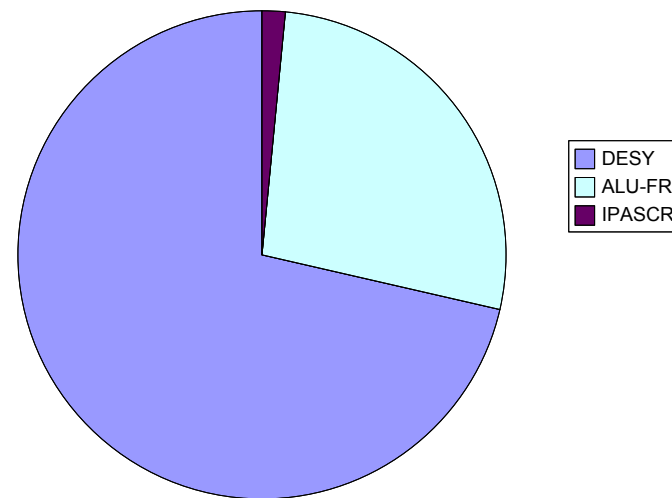
- **requirements:**
 - documentation and its regular update are of utmost importance
 - other EUDET participants should contribute by:
 - properly defining the requirements of the framework
 - providing and interfacing simulation and reconstruction software for the various detector technologies
 - testing the framework.
- **deliverables:**
 - we expect to have a **first version** of the common data analysis and simulation framework ready **after 18 month (now)**
 - development however must continue throughout the whole duration of the project to cope with

Contributors for task ANALYS

	DESY	ALU-FR	IPASCR	TOTAL
REQUEST				
Perm Staff ppm				
Temp Staff ppm	12.000	8.000		20.000
Perm Staff Cost kEUR				
Temp Staff Cost kEUR	62.500	46.875		109.375
Travels kEUR	1.300	0.867		2.167
Consumables kEUR				
Overheads kEUR	12.760	9.548		22.308
Total Manpower ppm	12.000	8.000		20.000
Total Cost kEUR	76.560	57.290		133.850
COMMITMENT				
Perm Staff ppm	12.000		3.000	15.000
Temp Staff ppm				
Perm Staff Cost kEUR	62.500		9.000	71.500
Temp Staff Cost kEUR				
Travels kEUR				
Consumables kEUR				
Overheads kEUR	12.500		1.800	14.300
Total Manpower ppm	12.000		3.000	15.000
Total Cost kEUR	75.000		10.800	85.800
TOTAL BUDGET				
Perm Staff ppm	12.000		3.000	15.000
Temp Staff ppm	12.000	8.000		20.000
Perm Staff Cost kEUR	62.500		9.000	71.500
Temp Staff Cost kEUR	62.500	46.875		109.375
Travels kEUR	1.300	0.867		2.167
Consumables kEUR				
Overheads kEUR	25.260	9.548	1.800	36.608
Total Manpower ppm	24.000	8.000	3.000	35.000
Total Cost kEUR	151.560	57.290	10.800	219.650

ALU-FR now RFWU-Bonn

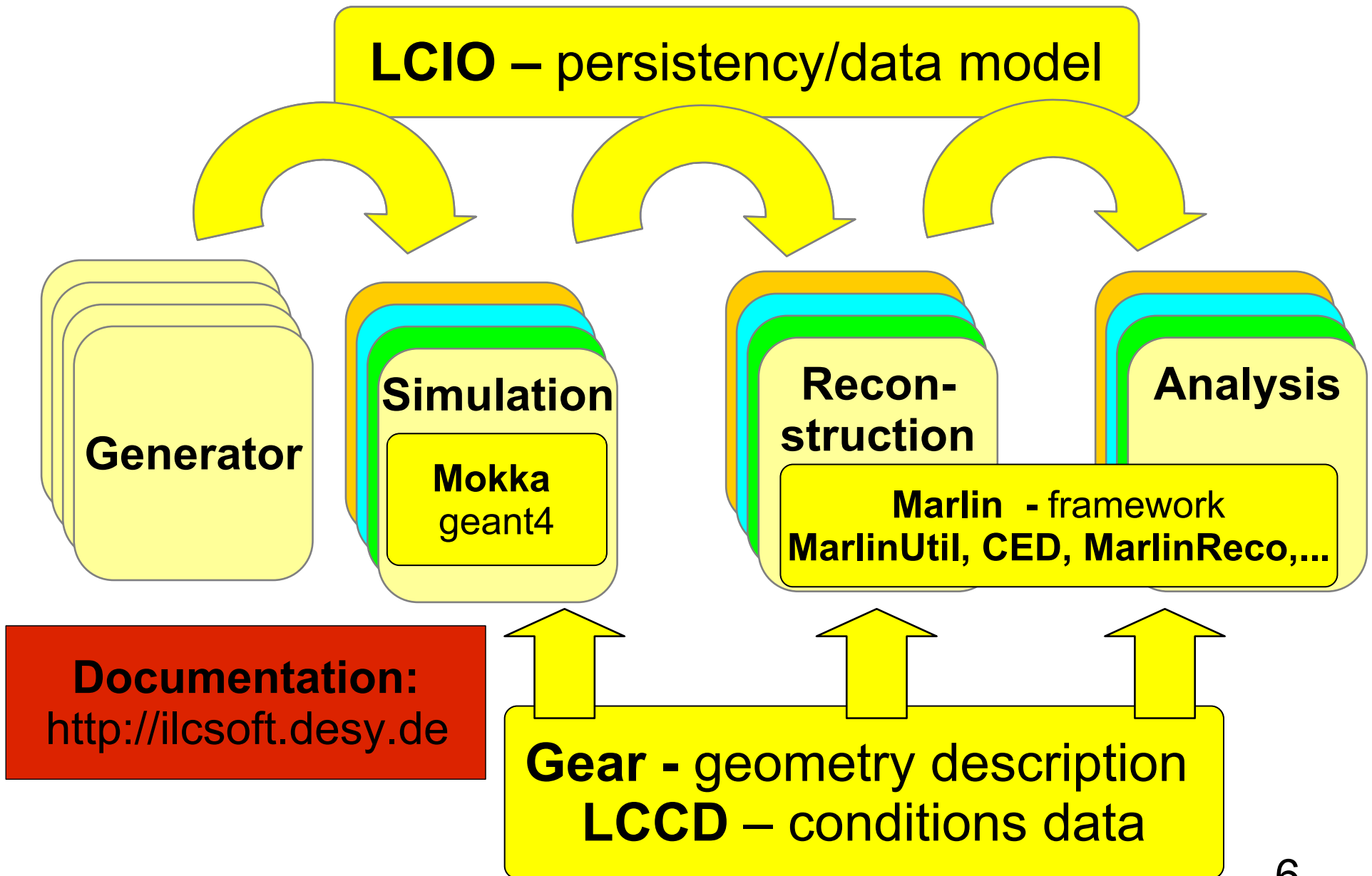
Contributors ANALYS
(Request+Commitment)



Usage of budget - ANALYS

- **DESY**
 - commitment 12ppm: F.Gaede 25% for full project length
 - 12ppm (scientist) converted to hire a programmer for 18 month
 - started August 2006 – ends December 2007
 - will use funds from COMP to extend contract until end of project (24 month)
- **RFWU-Bonn** (K.Desch)
 - 8ppm (scientist) combined with funds from JRA2 to hire a postdoc that works on JRA2 and ANALYS (*MarlinTPC sw project*)
 - started early 2007
- **IPASCR** (J.Cvach)
 - commitment 3ppm: PhD student that works part time on calorimeter simulation with geant

EUDET/LDC SW-framework



SW-framework recent developments

- installation script for all ILC software tools
 - download & build tools automatically
 - fully configurable python script
 - defines releases of core software tools
- reference installations/releases in afs (SL3, SL4)
- new build tool: cmake
 - allows for easy configuration and building the tools
 - will make porting the tools to other platforms easier
- Marlin-framework:
 - switched to shared libraries
 - plugin mechanism: decide at runtime(startup script) which modules are needed
 - build process greatly simplified (cmake)
- most of this done within EUDET project

status core software

- current release of core software: v01-01
 - /afs/desy.de/group/it/ilcsoft/v01-01 (SL3/SL4 only)
 - <http://ilcsoft.desy.de/ilcinstall>
- fully functional software framework for simulation, reconstruction and analysis of ILC (testbeam) data
- EUDET milestone: “Version 1.0 after 18 month” is reached
- Outlook:
 - improve performance of framework:
 - persistency – more generic data types for DAQ
 - I/O speed
 - conditions data access
 - ... user input needed

framework usage by EUDET activities

- **JRA3 - CALICE tbeam software**
 - usage of Mokka, LCIO, Marlin, Gear, LCCD
 - started before EUDET
- **JRA2 - MarlinTPC**
 - usage of LCIO, Marlin, Gear, LCCD
 - started with EUDET
- **JRA1 – EUTelescope**
 - usage of Mokka, LCIO, Marlin, Gear (LCCD?)
 - ported existing code to common framework early this year
- **all groups actively use the grid for data storage and processing within the VOs 'calice' and 'ilc'**

Summary

- NA2 task ANALYS: “Provide a software framework for simulation and analysis (of testbeam data)”
- EUDET milestone: “Version 1.0 after 18 month” is reached
- software is fully grid compatible
- grid used for data storage and analysis

All EUDET software activities within the JRAs are now carried out in the context of the existing software framework and grid installations

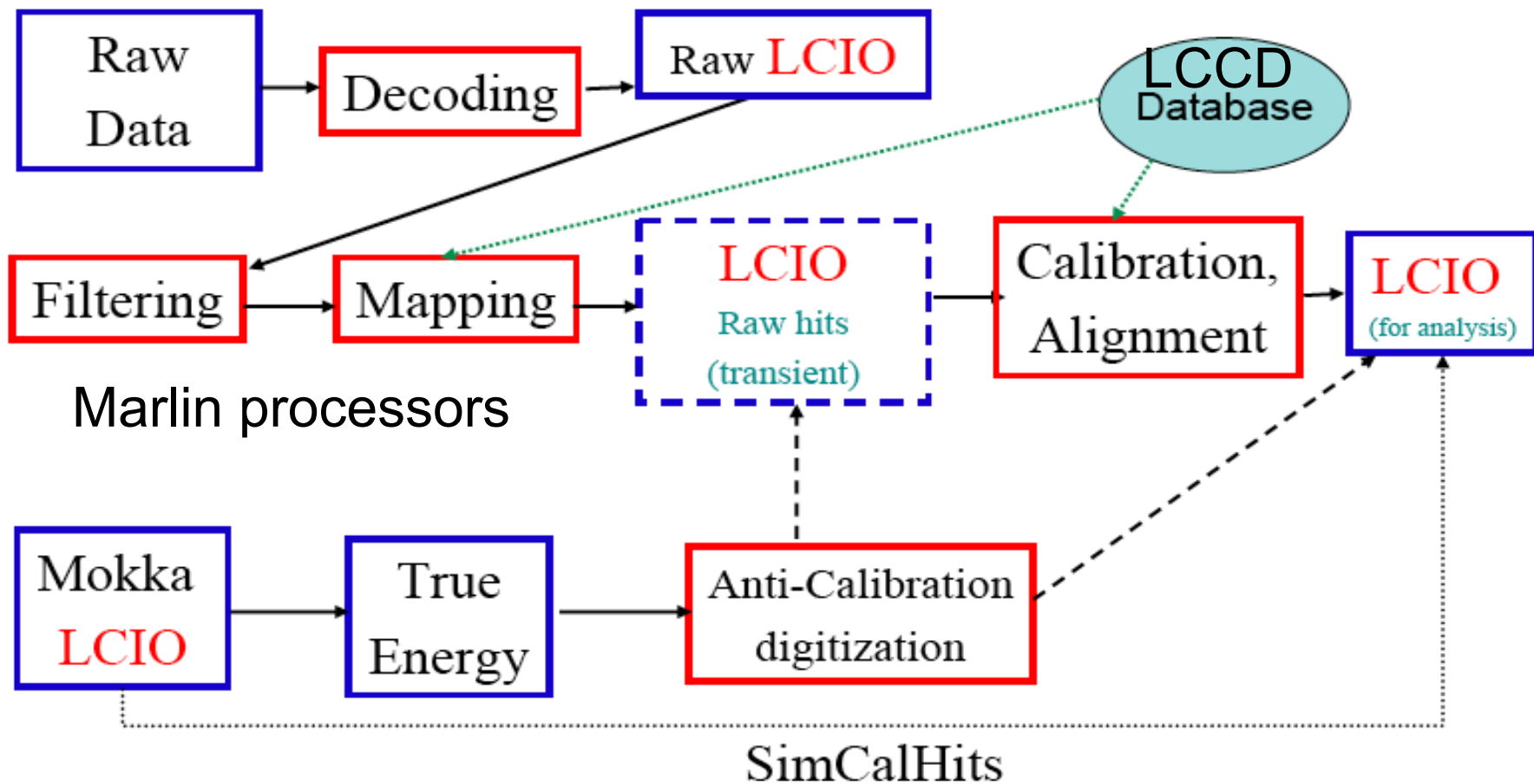
EUDET reports/memos for ANALYS and JRA software are in preparation



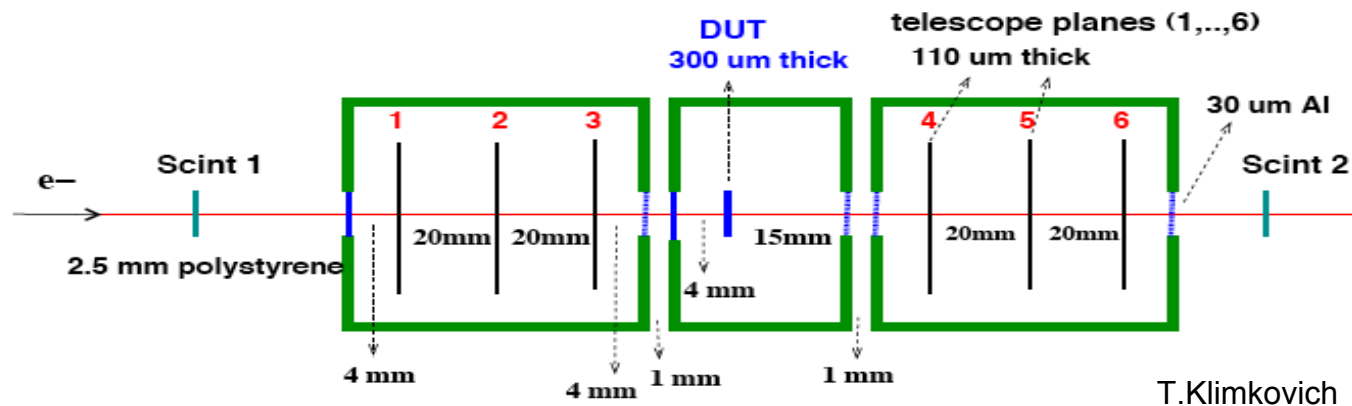
additional material

JRA3 – usage of framework example

Software – data flow



JRA1 – usage of framework example



- **Simulation: Mokka** (based on Geant 4)
 - New geometry driver **EUTelescope** has been created (on the way to be included into official Mokka release)
 - Class **TRKSD00** is used for telescope and DUT sensitive detectors
 - All parameters of the model are stored in **MySQL** database
 - Output: **LCIO** format files
 - Stored information: hit positions, deposited energy, ..
- **Telescope geometry interface** (within **Gear**) is implemented (will be included into next Gear release): detector “SiPlanes” of 2 types: **TelescopeWithDUT** and **TelescopeWithoutDUT**
- **Analysis: Marlin, Root, C++**

JRA2 – usage of framework example



Reconstruction

Data Structure	Processor Name	Collection Name
TrackerRawData		TPCRawData
	TrackerRawDataToDataConverter	
TrackerData		TPCConvertedRawData
	PedestalSubtractor	
TrackerData		TPCData
	PulseFinder	
	ChannelMapper	
TrackerPulse		TPCPulses
	HitFinder	
TrackerHit		TPCHits
	TrackFinder[Method]	
Track		TPCSeedTracks
	TrackFitter[Method]	
Track		TPCTracks

Correction processors (gain, pad response, linearity, time shift) still missing