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TPC Reconstruction Framework using LCIO and Marlin

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Introduction

- **Currently; large diversity of ILC TPC software**
- **At a TPC software meeting at DESY a detailed common software standards were agreed upon**
  - **Will facilitate the exchange of code and data**
- **Joined forces will create a "MarlinTPC" package by modifying existing code and writing new**
  - **Will be developed in a CVS repository at DESY**
- **6 TPC groups already involved, more are welcome!!!**

Document

Proposal for an ILC TPC data stream

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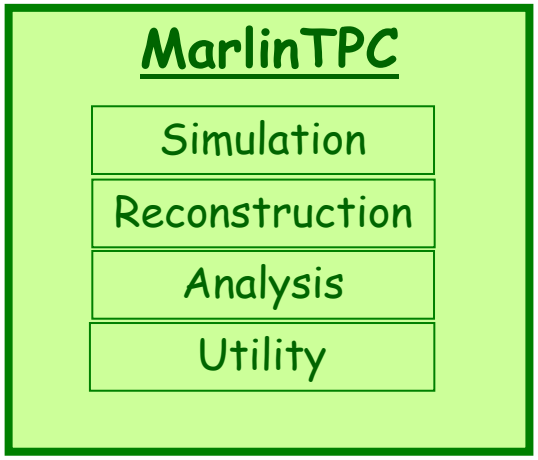
Abstract

This document proposes a TPC data flow model for use during ILC detector R&D studies. It is based on LCIO data structures and Marlin as analysis and reconstruction framework.

Package

- **The package will consist of Simulation, Reconstruction, Analysis and Utility code**



- **Agreements of simulation is still under progress**
  - **Some simulations exist already (see e.g. Jason Abernathy's talk tomorrow)**
- **This talk will mostly discuss agreements on reconstruction framework**

LCIO

- **LCIO (linear collider I/O) will be used**
- **LCIO has event reconstruction data structures**
  - **from raw data to reconstructed objects (e.g. tracks)**
- **LCIO leaves freedom to user**

http://lcio.desy.de

- **In the meeting it was agreed upon units, coordinate system etc. for the ILC TPC software**

Marlin

- **Marlin is a modular reconstruction and analysis framework based on LCIO**
- **User writes “marlin processors” that execute reconstruction or analysis steps**

http://ilcsoft.desy.de/marlin

- **In the meeting it was agreed upon processing steps (i.e. marlin processors) and the interfaces in between (i.e. LCIO structures)**

GEAR and LCCD

- GEAR is a geometry library (api) for reconstruction
- LCCD is a toolkit to read from a condition data base

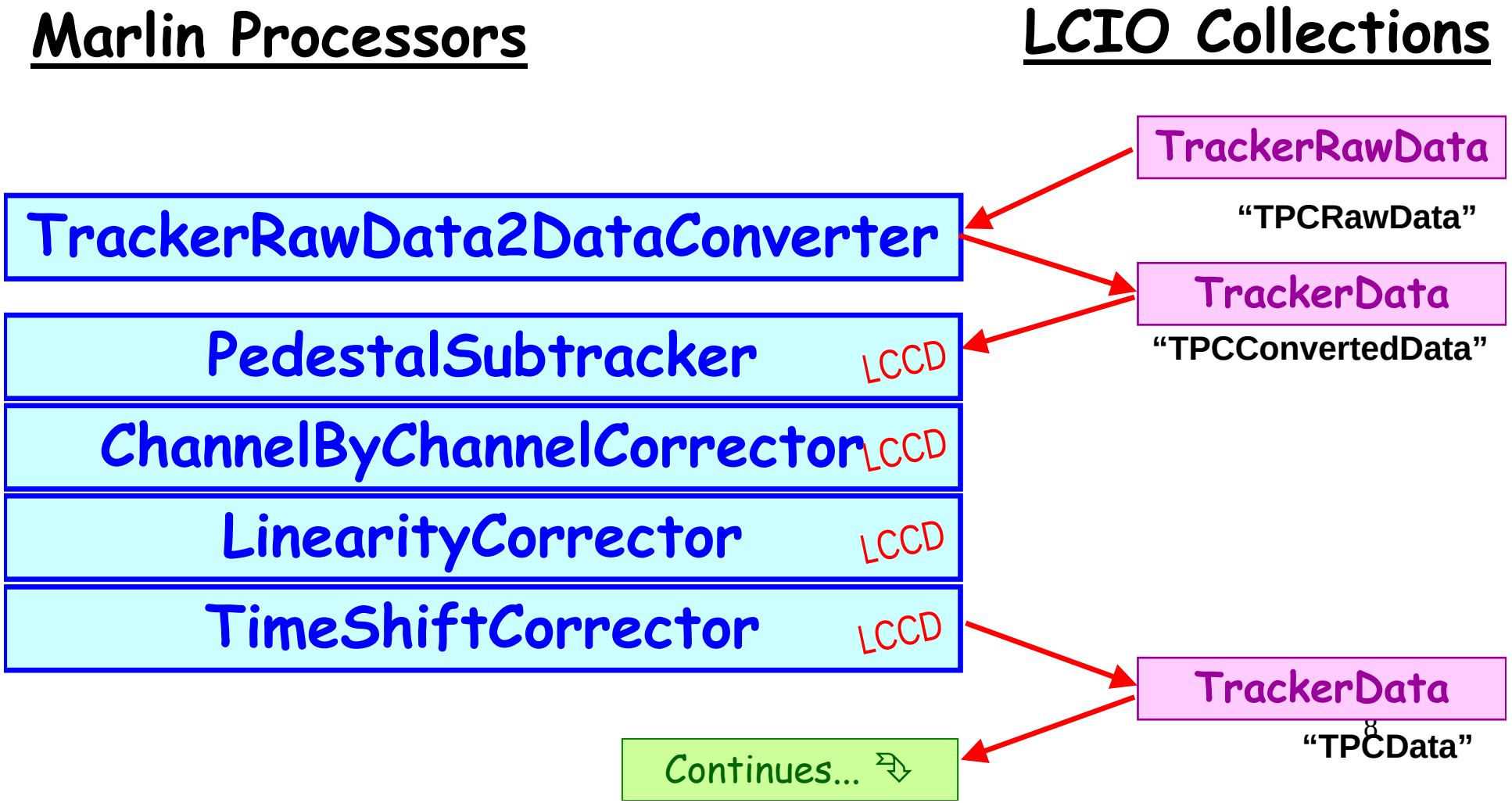
http://ilcsoft.desy.de/gear

http://ilcsoft.desy.de/lccd

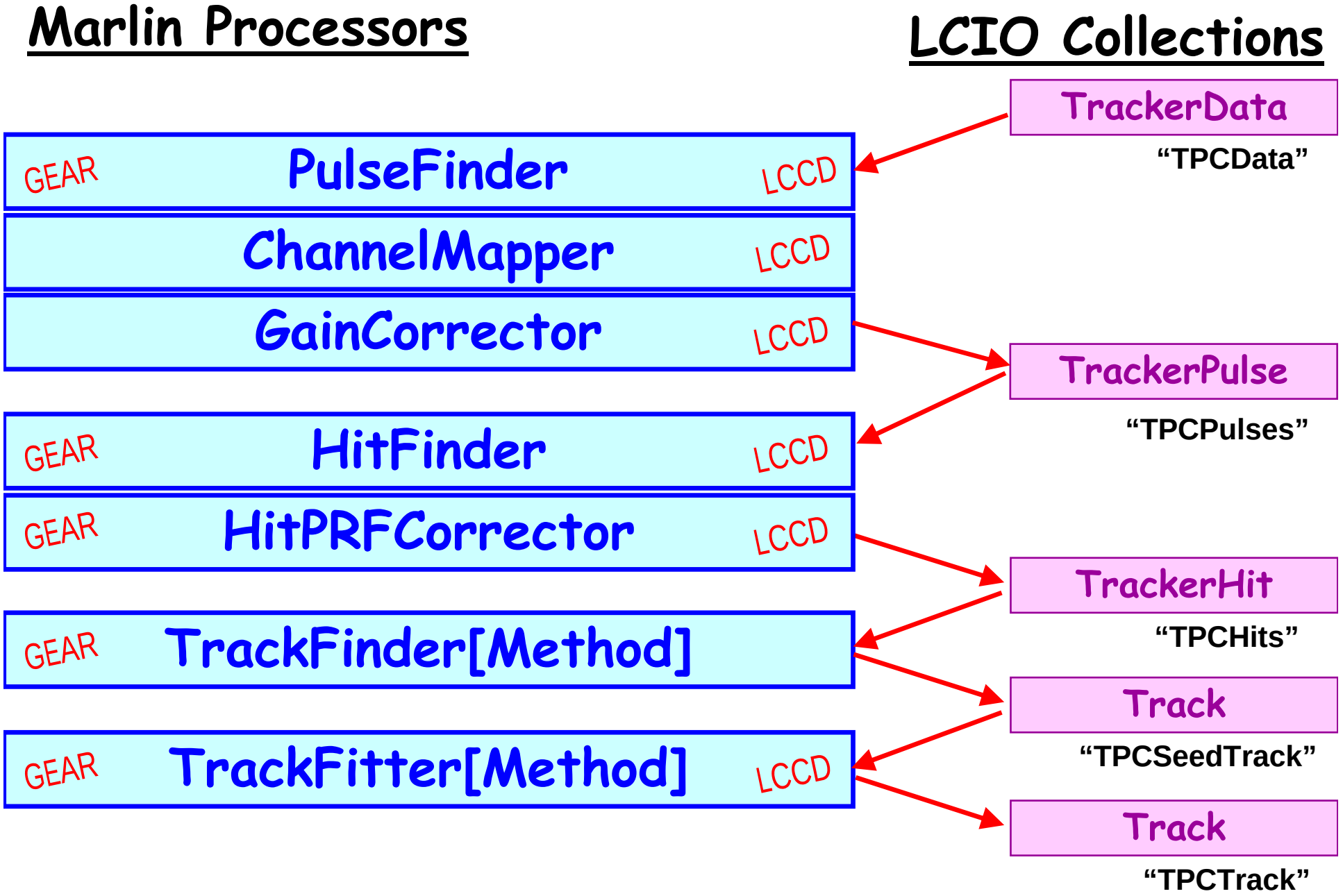
- In the meeting it was agreed upon that
  - GEAR will store static information (pad geometry, read out frequency etc.) and
  - LCCD will store condition data that can change during data taking (drift velocity, voltages, B field, calibration data etc.)

Reconstruction Chain (1)

- **The proposed data flow for reconstruction**



Reconstruction Chain (2)



Conclusions

Package

- Agreements has been made on how LCIO, Marlin, GEAR and LCCD will be used to write a MarlinTPC package
- Manpower is needed! Please join!

Framework

- For any ILC TPC related software production using LCIO please follow our framework
  - Could also be used in other implementations (e.g. outside Marlin) to facilitate comparison

Paper

- A document is currently being written by Peter Wienemann

Web

- More info here:

http://www-flc.desy.de/ilcsoft

http://particle.phys.uvic.ca/~mcgeac00

http://particle.phys.uvic.ca/~hansen/ILC/MOKKA/installation.html