

aidaTT

Status of Tracking Toolkit

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ILD Analysis and Software Meeting

aidaTT in a nutshell

Tracking Toolkit

- Track fitting functionality
- Track finding functionality
- Track gymnastics (extrapolation, propagation, intersections, ...)

aidaTT extends and succeeds IMarlinTrk

- IMarlinTrk focussed on Kalman Filter
- Mixture of abstract and specific methods/implementations

Computational Design

- Completely modular
- Clear API to reco frameworks
- Complete separation of data, algorithms and functionality
- Parallelization on single track level possible

Implementation status

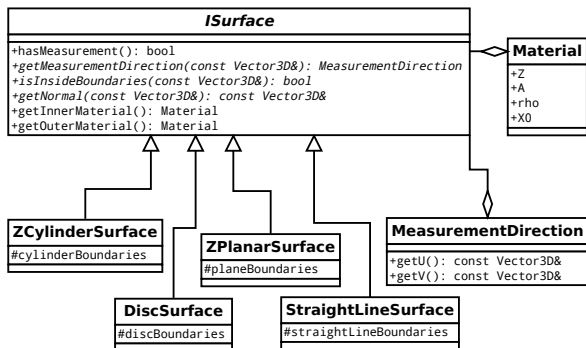
Done earlier this year

- B Field (constant)
- General Broken Lines as Fitting Tool
- Propagation methods (simplified/fast and analytic)

Addition of small helpers with testing

- Fast fitting of straight lines/circles in $r\phi$ and sz plane
- Typification of track parametrizations
big bumper: L3, LCIO and perigee are different
- Persistency connection to LCIO

First big leap: dd4hep::ISurface



dd4hep::ISurface

- geometry provides shapes & boundaries, answer to `isInside?`, material info, normal vectors and measurement directions
- tracking provides intersection calculation
- thoroughly tested by now

Second big leap: DDSim & convertToGEAR

DDSim simulation

- Tracking detectors implemented
- Constant progress on description of sensitive detector
- Needs more work for tracking purposes

Very recent: convertToGEAR

- Tracking detectors implemented (DD4hep is the basis)
- Allows to run standard Marlin reconstruction on DD4hep geometry (!)
- Enables direct comparison between "new" and "old" reconstruction

Current topics/next steps

Imminent

- Create resolution plots for new Mixed-Mode-Reconstruction
- Finish debugging for material interaction

Next steps

- Revise IMarlinTrk
- Include aidaTT tracking in Marlin
- (Add finding functionality)

Technical details

Building

- CMake build system
- Different targets: default/install, examples, tests
- Unit test framework included
- svn repository:
<https://svnsrv.desy.de/public/aidasoft/aidaTT>

dependencies

required:

- gsl – for internal matrix and vector calculation

optional (basic/dummy constructs are still inside):

- GBL – for fitting functionality
- LCIO – for persistency
- dd4hep – for geometry abstraction