



# Status of Track-based Muon Chamber Alignment

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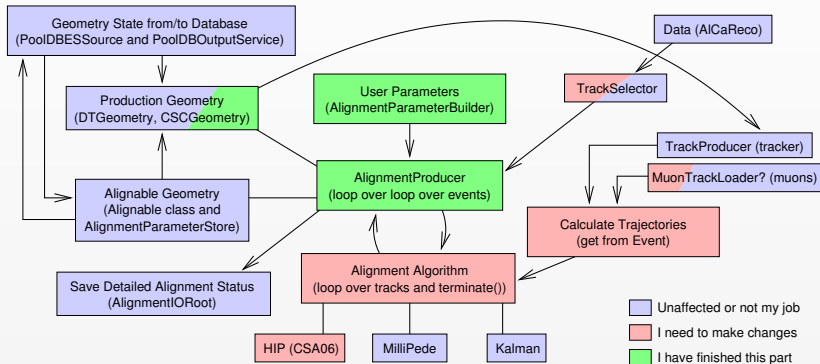
14 November, 2006



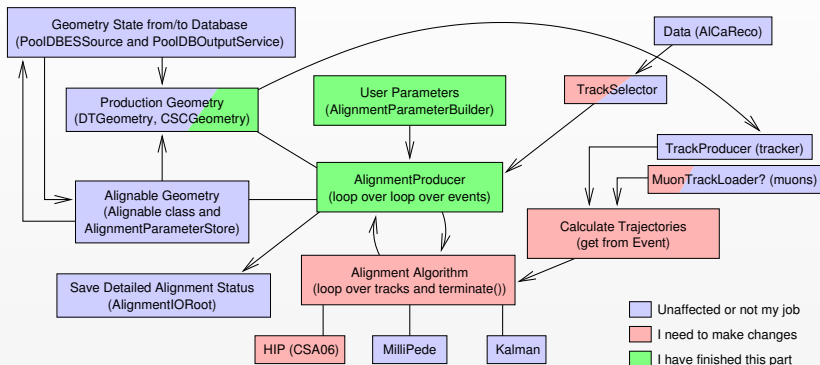
## Overview

- ▶ I am extending `CommonAlignmentProducer` to
  - a) move muon chambers
  - b) calculate muon residualssuch that existing algorithms apply to muons
- ▶ Most of the infrastructure is already general
  - ▶ muon and tracker inherit from the same classes
  - ▶ I change the input and the generic class is passed through the system
- ▶ Progress has been smooth: partially updated local copy compiles and runs
- ▶ I've tested each feature change, but not the whole system

## Details

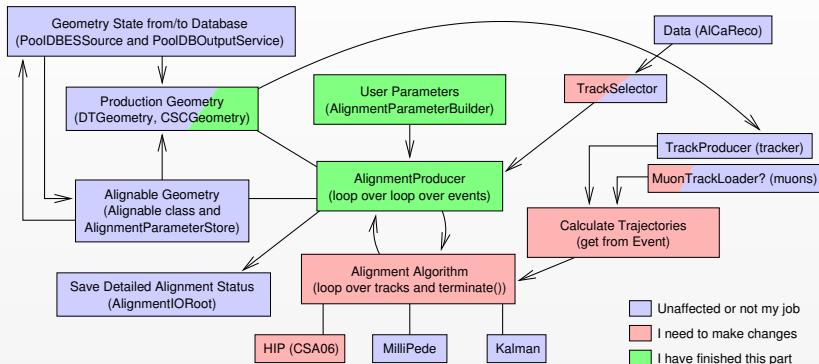


## Details



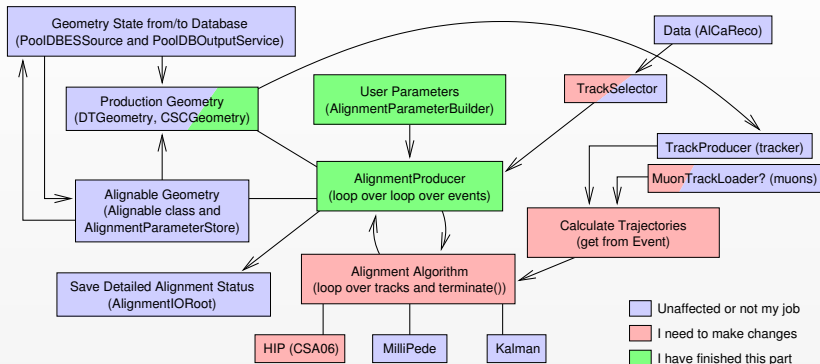
TrackSelector should require muon hits when doing muon alignment (easy)

## Details



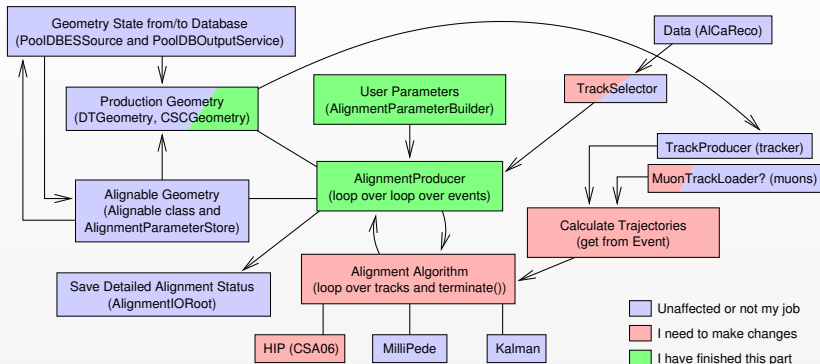
User Parameters: AlignmentParameterBuilder now selects muon Alignables, configurable with PSet ✓

## Details



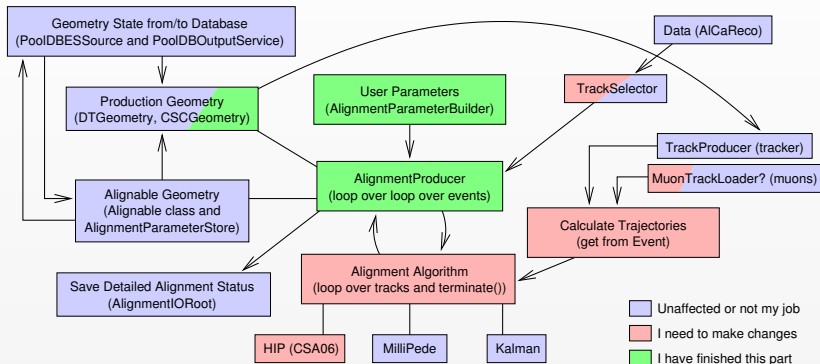
Production Geometry: DT(CSC)Geometry objects built by DT(CSC)GeometryBuilderFromDDD, not const ✓

## Details



Alignment corrections successfully applied from Alignable Geometry to Production Geometry ✓

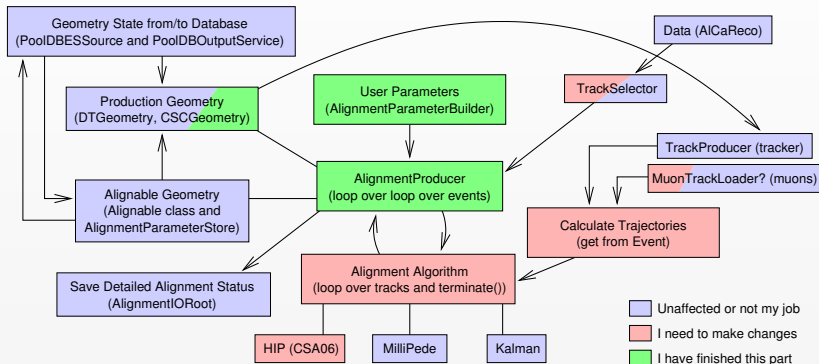
## Details



AlignmentProducer produces DT(CSC)Geometry (exports to Event) (still testing)

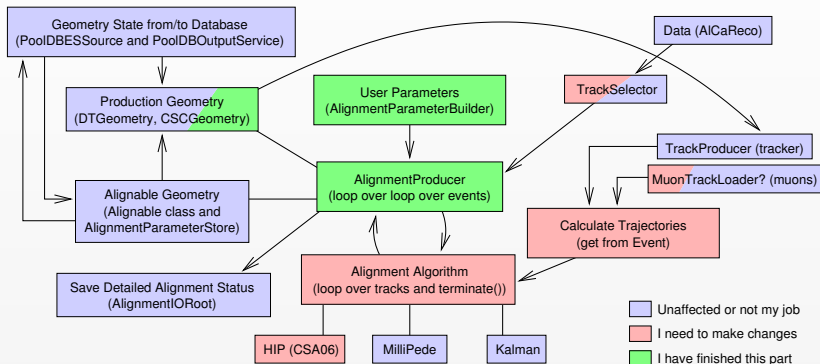


## Details



All AlignmentAlgorithms need AlignableMuon\* added to their initialize() argument lists (possibly other minor changes)

## Details



Trajectories (for calculating residuals) may be loaded from Event, greatly simplifying existing code



## Trajectories from Event

- ▶ Until recently, Trajectories could not be stored, so AlignmentAlgorithm recreated them with refitTracks()
- ▶ Now they may be stored, we want to load with getByLabel()
- ▶ MuonTrackLoader has PutTrajectoryIntoEvent parameter: perhaps this could be our refitter (e.g. for Kalman)?



## Updating All Three Algorithms

- ▶ I consider it my job to get CSA06AlignmentAlgorithm working for muons (testing and understanding the output)
- ▶ MillePedeAlignmentAlgorithm loads Trajectories in the same way: update might be automatic (will be straightforward)
- ▶ KalmanAlignmentAlgorithm refits Trajectories; may require additional work or MuonTrackLoader

Updates to CSA06AlignmentAlgorithm provide a template for the other two algorithms



## Plans

1. Finish updating local copy of AlignmentProducer (1–2 weeks)
2. Make sure CSA06AlignmentAlgorithm can do a muon chamber alignment (few weeks?)
3. Carefully merge changes into CVS...
4. Expand monitoring of alignment procedure
5. Branch off HIPAlignmentAlgorithm