New AICa streams for CSC alignment

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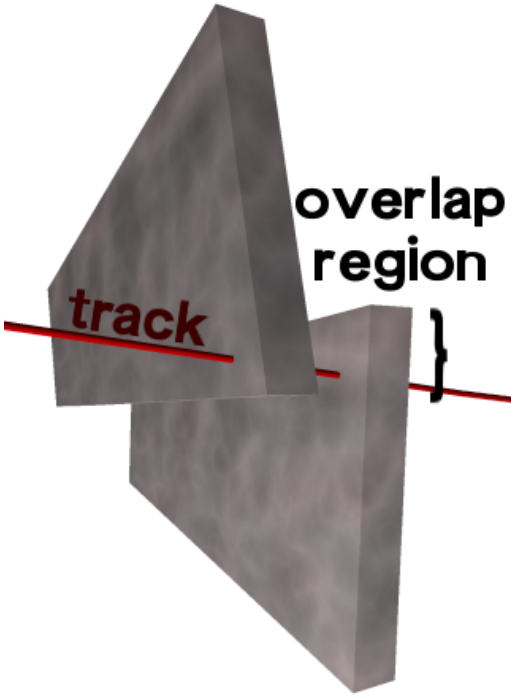
28 February, 2008

Why?

- CSC overlap regions could be very useful for relative alignment of chambers on rings
- Tracks don't propagate through iron between chambers, so the energy threshold doesn't need to be as high
- Procedure must reject non-overlap tracks, as they would interfere with alignment
- An enriched sample would make this more efficient
- Collision muons and beam-halo muons are both good sources of overlap tracks
- Beam-halo is also useful in the non-overlap case, for layer alignment



New streams

There are cffs for three new streams in Alignment/CommonAlignmentProducer V00-26-00:

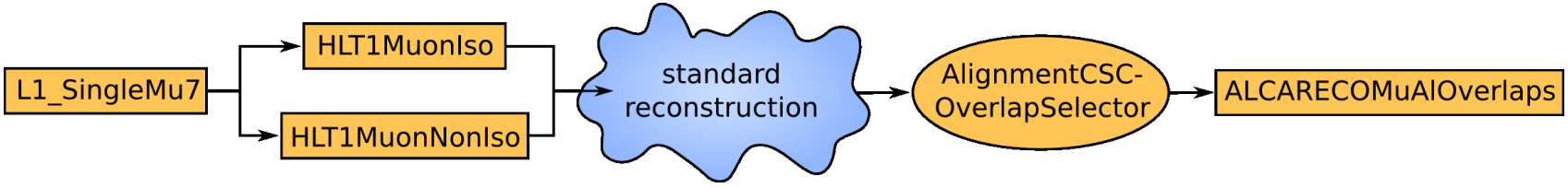
- ALCARECOMuAlOverlaps: standard-trigger muons in an overlap region
- ALCARECOMuAlBeamHalo: beam-halo muons
- ALCARECOMuAlBeamHaloOverlaps: beam-halo muons in an overlap region

Continuations of the new HLT paths presented at yesterday's Trigger Plenary.

Two new track selector modules (analogous to AlignmentTrackSelectorModule):

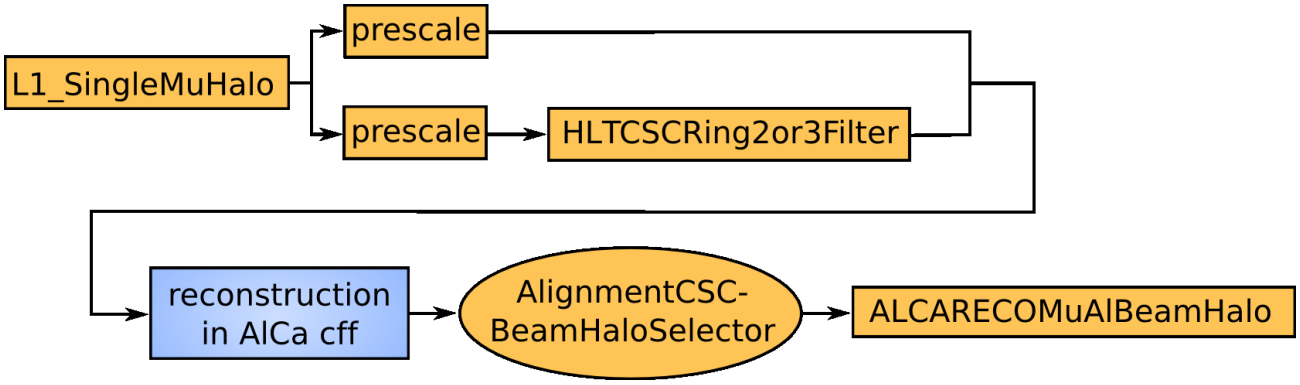
- AlignmentCSCOverlapSelectorModule
- AlignmentCSCBeamHaloSelectorModule

Collision muons in the CSC overlap regions



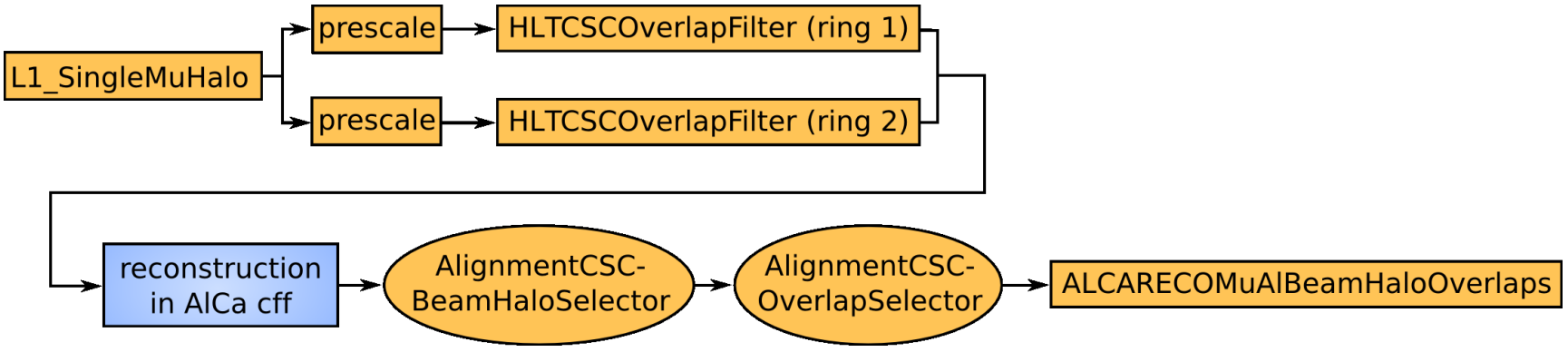
- Everything through "standard reconstruction" is just like ALCARECOMuAlZMuMu, the standard muon alignment stream
- AlignmentCSCOverlapSelectorModule selects tracks with ≥ 4 hits on each of two chambers in the same station
- Later in processing (during or before alignment procedure), the same module will be used to select overlaps in a given station

All CSC beam-halo



- Beam-halo events need to be reconstructed with the non-standard CosmicMuonProducer
- Proposal: do that reconstruction in the cff file that defines the AlCa stream
- (same thing for tracker beam-gas and tracker cosmic rays)
- AlignmentCSCBeamHaloSelectorModule requires ≥ 4 hits on a given number of muon stations: the only way to cut on beam-halo energy

Beam-halo in the CSC overlap regions



- Re-use modules from the previous two cases
- (the HLT paths are different)

Conclusions

Pending approval, I'd like these to be published to 2_0_X.

- The two selector modules have been tested on beam-halo MC.
- The full AlCa chains have not: if there's a mistake, I'll need to correct it before we attach these cffs to a real AlCa production
- The L1 trigger bits at the beginning of the chain are not set to meaningful values, anyway.