CKF & VXD Hit Recovery for Belle 2
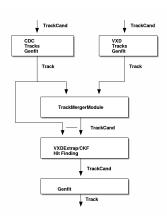
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Data Flow Through Merging and Fitting

A short reminder on the setup I'm working on

- Search through the merged TrackCands, take the CDC-only ones
- From the corresponding *Track*
    - Extrapolate back a layer, search for compatible (within a sensor-width/length+whatever χ^2, hole count, etc. compatibility tests) hits
        - CKF: Create new Track for each additional hit and have them compete based on a quality,
        - VXDExtrap: Take "best" hit
    - Using genfit tools, perform a Kalman update on the new hit
    - Continue for all layers/tracks

Kalman Update Technicalities

- Add the hit to the beginning of the track hit list (in 0 position)
- Updates using `fitter->processTrackPartially(track, track->getCardinalRep(), 1, 0)`
    - Takes the 2 hit for initial estimate
    - Extrapolates and updates to hit 1, then hit 0 (the hit I actually added)
- Checks in the code disallow fitting one extra hit backward
- Also means I can't use pruned tracks, as pruning removes all but first point, and I need an extra point for the first added hit
    - Lots of copies required CKF for all the competing tracks
- Really, just want a smaller wrapper around `processTrackPoint`, which actually does the extrapolation and update, `processTrackPartially` (and friends) ensures setting up the initial seed
- Hacked up a `processSinglePoint` which checks the seed is set up and passes it directly to `processTrackPoint`
    - Needs change to genfit as `processTrackPoint` is private

Backup