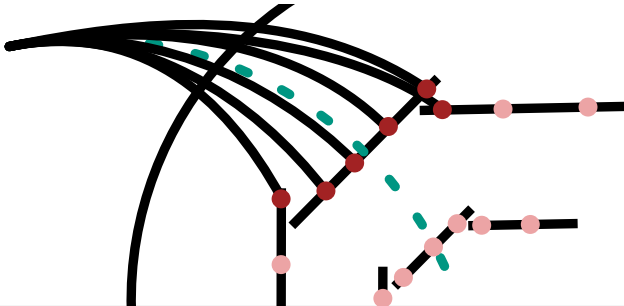# Combinatorial Kalman Filter - Status

Weekly Tracking Meeting.

Nils Braun | 06.07.2017

Disclaimer

- I could not spend much of my time on CKF, because of B2GM, HLT, Cosmics and ...
- holidays :-)

Outlook from F2F Elba

Still to do:

- Test resolution on different event samples (full $\Upsilon(4S)$, after VXDTF).
- Implement a good overlap quality index and refine overlap check.
- Still problems with hit inefficiencies (probably a bug).
- Clean-up code a bit.

Outlook from F2F Elba

Still to do:

- Test resolution on different event samples (full $\Upsilon(4S)$, after VXDTF). **Currently ongoing, see below**
- Implement a good overlap quality index and refine overlap check. **Done**
- Still problems with hit inefficiencies (probably a bug). **Done**
- Clean-up code a bit. **Done**
- Include single SVD clusters and PXD hits. **Currently ongoing. Code is ready.**
- Find a solution how to include it in the full stack. **See below**

Code rework

- Tried to simplify the data flow
- Tried to use templates as much as possible and summarize everything related to VXD in only a few objects -¿ make transition to CDC, PXD and single SVD clusters easier.
- Optimized (the memory footprint and) the execution time.
- Cleanup up.
- Included MVA filters and training methods.

Comparison with VXDTF2
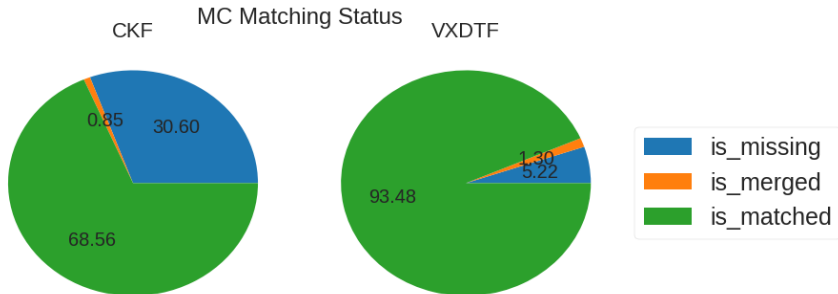
Only VXDTF 2	0.355
Only CKF	0.023
Both	0.578
None	0.041

MC Matching Status

CKF

VXDTF

0.85
30.60
68.56

1.30
5.22
93.48
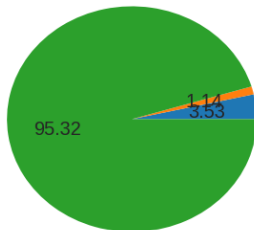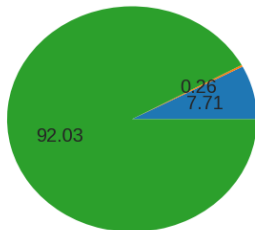
- is_missing
- is_merged
- is_matched

MC Information is used!

Comparison with VXDTF2

Only VXDTF 2	0.355
Only CKF	0.023
Both	0.578
None	0.041

MC Matching Status on found and fitted CDCs

MC Information is used!
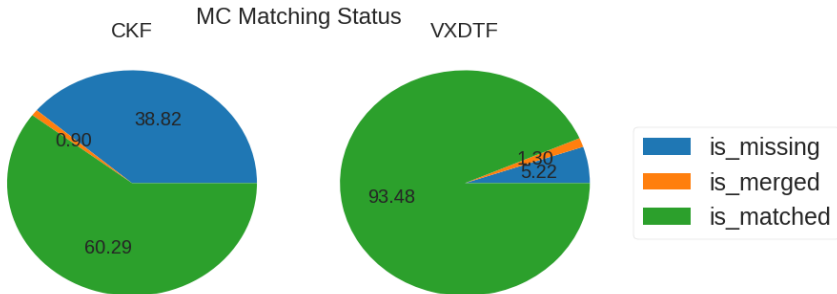
Comparison with VXDTF2

Only VXDTF 2	0.355
Only CKF	0.023
Both	0.578
None	0.041

MC Matching Status

CKF

VXDTF

- is_missing
- is_merged
- is_matched

Comparison with VXDTF2

Only VXDTF 2	0.355
Only CKF	0.023
Both	0.578
None	0.041

MC Matching Status on found and fitted CDCs
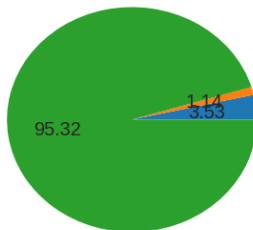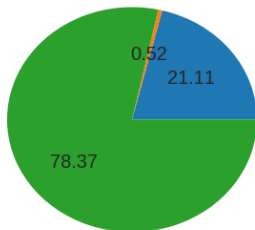
When to run the CKF?

I currently see the following possibilities:

- Before VXDTF: Reduce combinatorics, sector map for certain pt range?

- After VXDTF: may use VXDTF information (how?). Fake reduction VXD (overlap check?), nor merging needed? On which hit set? May produce more fakes?

Next steps

- Go on with comparing VXDTF2 and CKF.
- Find reasonable cuts for PXD and single SVD clusters.
- Still, the overlap filter needs some refinement.
- Solve the tracking-stack-combination issue.
- Introduce cuts dependent on the pt range of the CDC tracks.