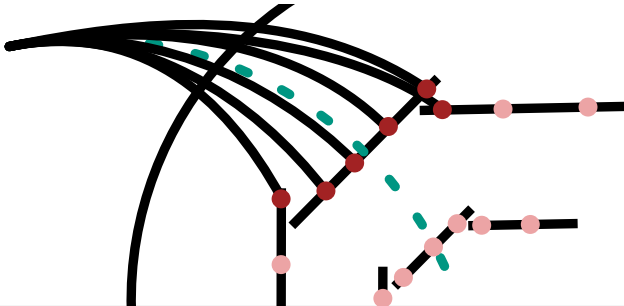


Combinatorial Kalman Filter - Status

Weekly Tracking Meeting.

Nils Braun | 21.07.2017

IEKP - KIT



Sector Map

As discussed in last weeks tracking meeting, I am using the Muon Map trained by Jonas, as I am not able to process the sector map in the database (because of memory restrictions).

Background

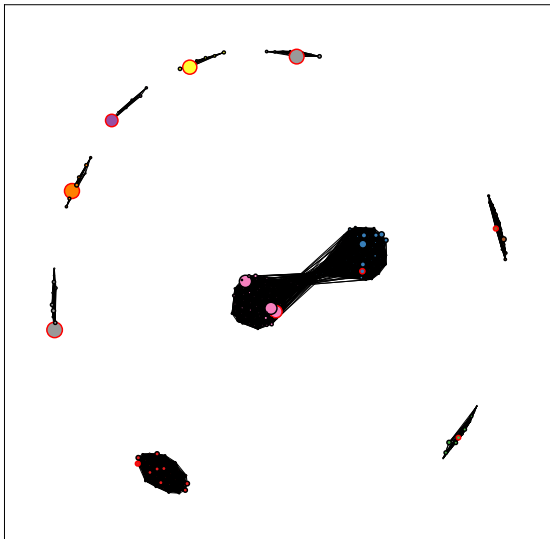
I am using 15th campaign background. All results include secondaries!

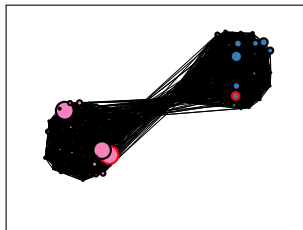
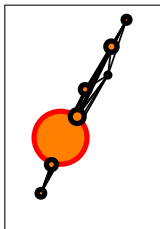
- 1 For each Seed: find all possible matching *hit trains*, using:
 - simple filters
 - extrapolations
 - Kalman updates and more filters

This part was already shown in Elba.

- 2 **Apply a filter on each found candidate**
- 3 **Resolve Overlaps**

Overlap Check



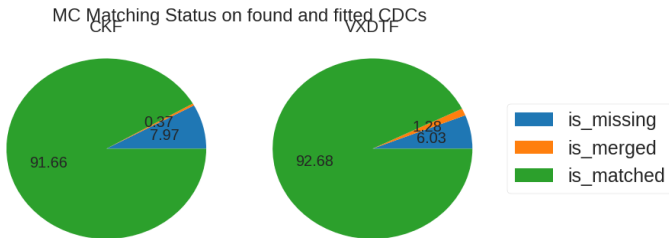
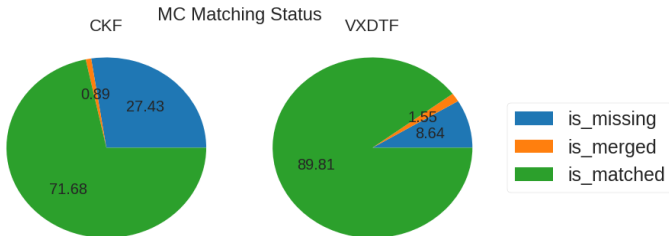


- The size of the nodes is the filter response of an MVA method.
- The red or black outline is correct or not (correct = at most 1 wrong hit and the most correct hits for a given seed)
- Same color means same CDC seed.
- Nodes share an edge if they share hits and/or if they share the same CDC seed.
- Conclusion: No overlap check needed? (call it *seed check*).

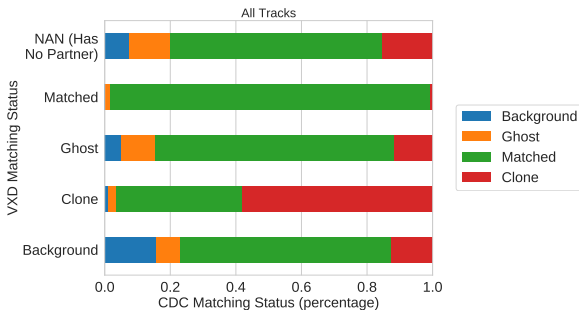
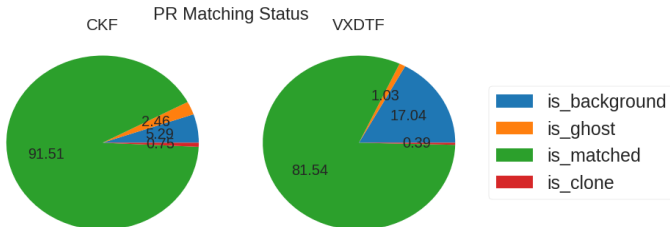
Different Overlap Checks

	hit eff.	hit purity	find. eff.	1 - fake rate
cut: 0.0, greedy, mva, overlap check	89.79%	99.32%	72.23%	89.89%
cut: 0.0, no greedy, mva, overlap check	90.90%	99.48%	65.30%	95.93%
cut: 0.0, no greedy, mva, seeds overlap check	89.90%	99.29%	72.09%	89.41%
cut: 0.01, greedy, mva, overlap check	90.09%	99.33%	71.59%	91.30%
cut: 0.01, no greedy, mva, overlap check	89.81%	99.37%	69.41%	93.58%
cut: 0.01, no greedy, mva, seeds check	90.20%	99.31%	71.48%	90.72%
cut: 0.1, greedy, mva, overlap check	92.40%	99.50%	62.28%	96.86%
cut: 0.1, no greedy, mva, overlap check	91.77%	99.47%	62.26%	96.88%
cut: 0.1, no greedy, mva, seeds check	92.43%	99.49%	62.31%	96.63%
no greedy, truth_teacher, seeds check	93.07%	99.72%	72.76%	90.24%

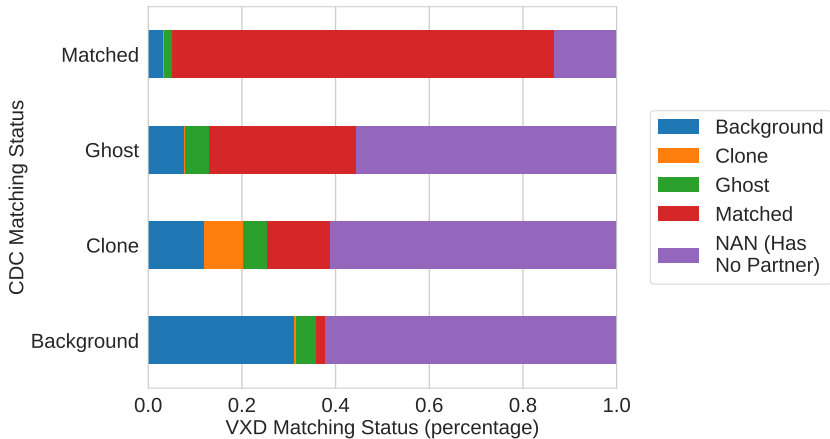
The rest will be done using the settings shown in **bold**.



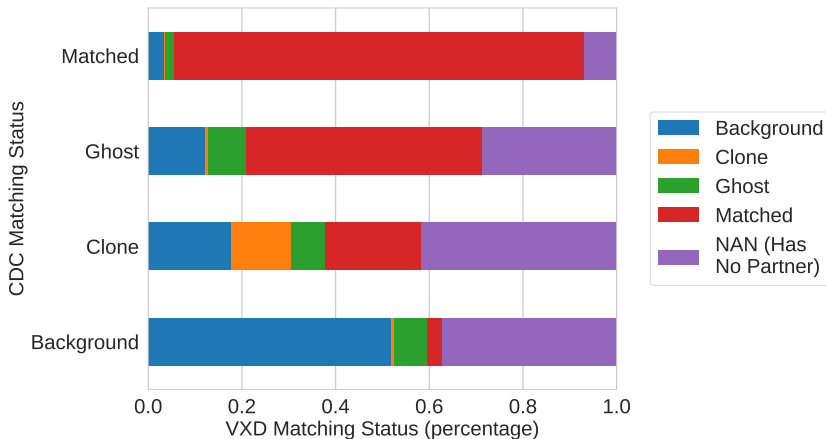
Matching Status



Matching Status



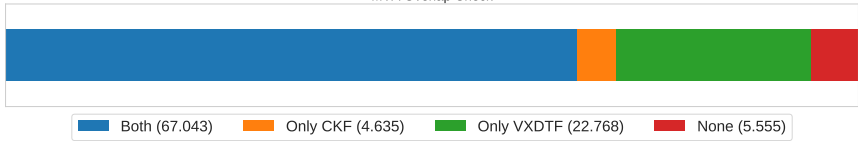
Matching Status



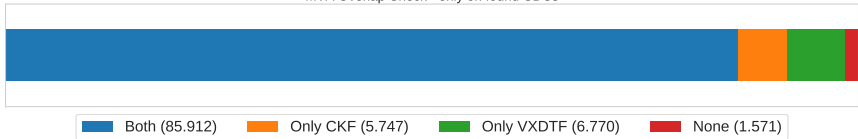
Only on fitted tracks.

Comparison With VXDTF2

MVA Overlap Check



MVA Overlap Check - only on found CDCs



	VXDTF2	CKF + VXDTF2	with MC
finding efficiency	89.81%	93.99% (4.18%)	94.24%
hit efficiency	94.48%	91.59% (-2.90%)	93.73%
hit purity	98.67%	98.88% (0.21%)	99.22%
purity	81.93%	79.38% (-2.55%)	79.47%

- 1 CDC Track finder runs on full hit set.
- 2 CKF runs with the information from the CDC track finder on full hit set.
- 3 VXDTF runs only on hits, which do not share a cluster with the already found tracks.

Finding Efficiency was increased by over 4%!

- Still to do: single clusters and PXD hits (have some memory problems here, but should be solvable)
- Merge the remaining CDC tracks with the remaining VXD tracks
- Pull Request!

