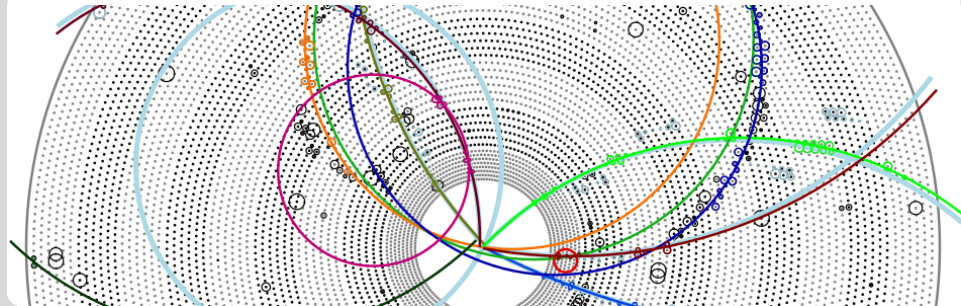# T_0-Estimation using CDC Drift Circles.

Weekly Tracking Meeting.

Nils Braun | 30.09.2016

Work to be done

What is still needed:

- Include the algorithm into the whole tracking data flow. ✓
- Study the impact of a wrong track time onto track finding and fitting. ✓
- Find reasonable settings for the track finders and the time extrapolation (e.g. only use some tracks for timing). ✓
- Give a talk on the translator-issue (negative drift times) in the CDC meeting.
- Test the module in the CDC-Cosmics test end of this year.

Work performed since last meeting

- Written a *Selection* module
- Create an `EventT0` dataobject and incorporate it into the TDC translator (and all track finding/fitting modules)
- Test the influence of "wrong" t0 for track finding and fitting.

Selector module

- Do only use one track for the track time extraction
- Use the one with the highest p_T, that was found and **fitted**.

Influence on track finding

	Efficiency	Hit Efficiency
No Shift	0.76 (0.76)	0.8213 (0.818)
Shift -20 ns	0.7502 (0.748)	0.814 (0.815)
Shift +20 ns	0.7347 (0.75)	0.787 (0.813)

Efficiencies without fitting for different t_0 shifts in CDC only. In brakets: track time extracted from MC tracks using the module.

There seems to be not a huge influence on track finding from the shift.

Influence on track fitting

However, there is (as expected) a strong influence on the track fitting:
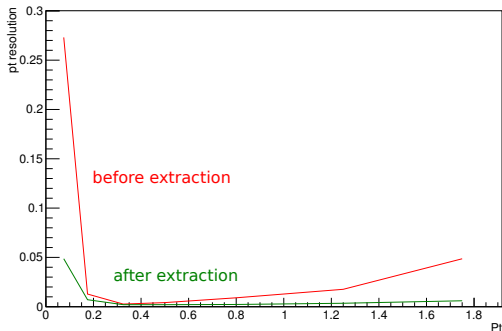
My proposal would be, to do the track finding in HLT (FastReco) without any track time extraction (also because of execution time) and do the track time extraction only before fitting (meaning only when we are more or less sure to save the event).

Working with real tracks in real events
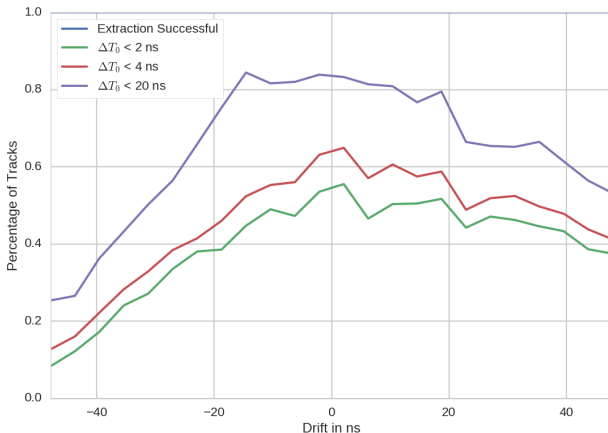
Module works not as good as expected. Problems: Correction makes track non-fittable, correction "runs away".

Todo

- Track Time Extraction from Tracking Detectors is/should be part of the November Release. However, there is now at least a running version (but with not-optimized results).
- Pull-Request on `EventT0` open (will hopefully be merged soon).
- Make the optimization to the real t0 more "clever".