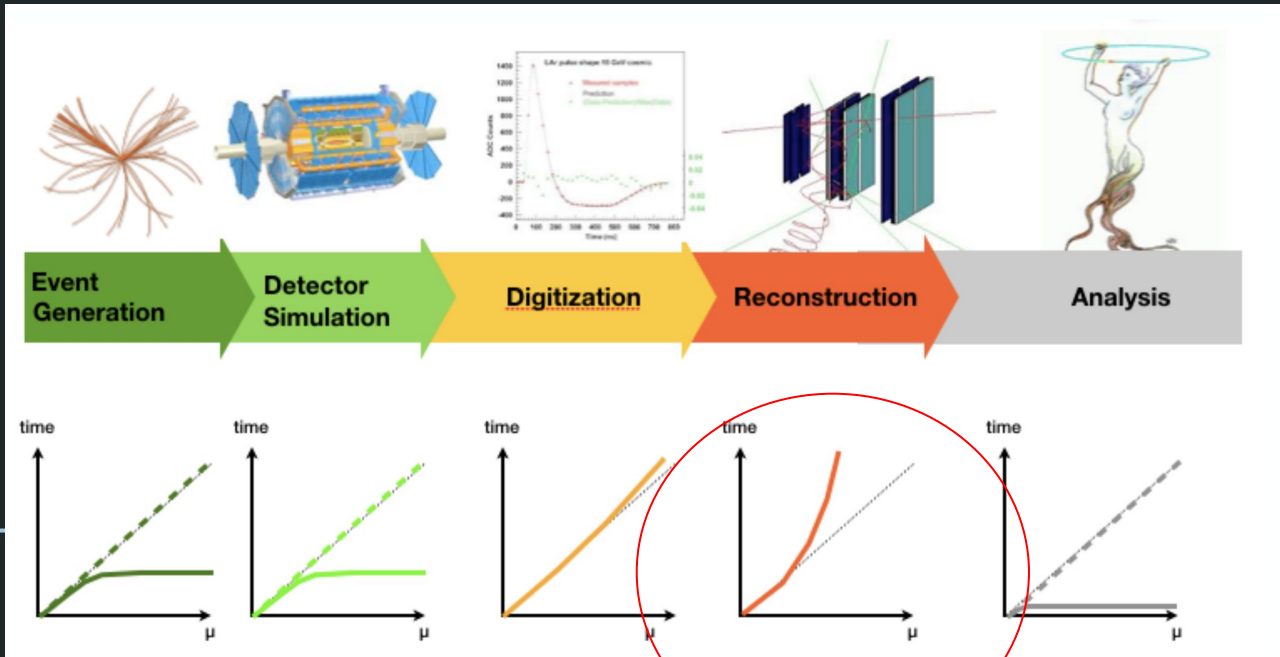


Update on timed Track Seeding

FCChh Detector Meeting

Dec 19, 2018
Valentin Volkl
Univ. Innsbruck

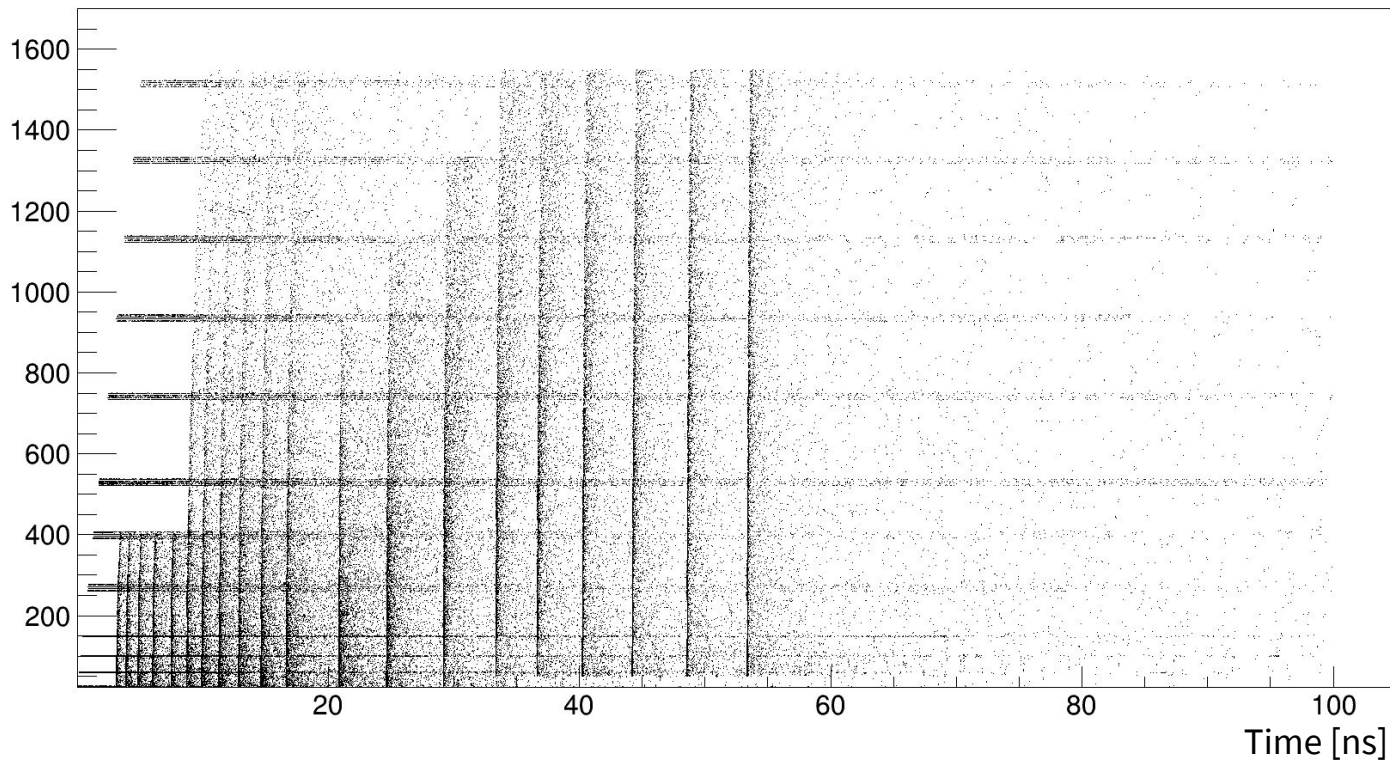


© Andi Salzburger

Time structure of an event

Radial Distance [mm]

Tracker Hits

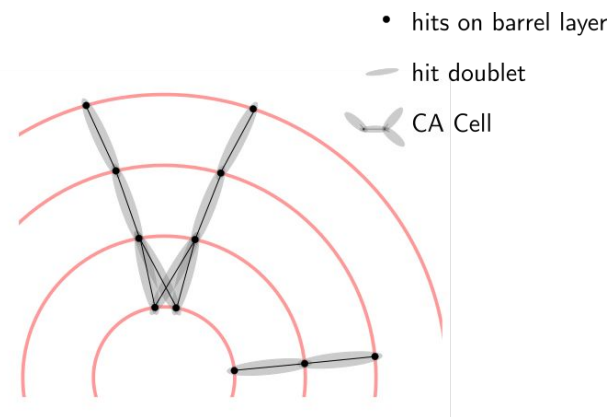


Track Seeding:

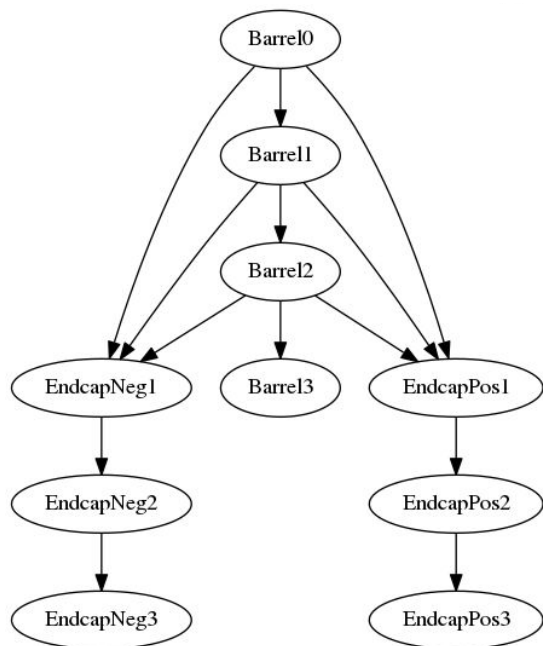
`tricktrack::HitChainMaker`

- Cellular Automaton based approach performs well in CMS
 - 3 stage strategy:
 - Hit Doublet Creation (very simple geometrical track candidate rejection)
 - Connecting doublets to CA Cells (simple geometrical track candidate rejection)
 - Evolve cells N times to find N-sized tracklets

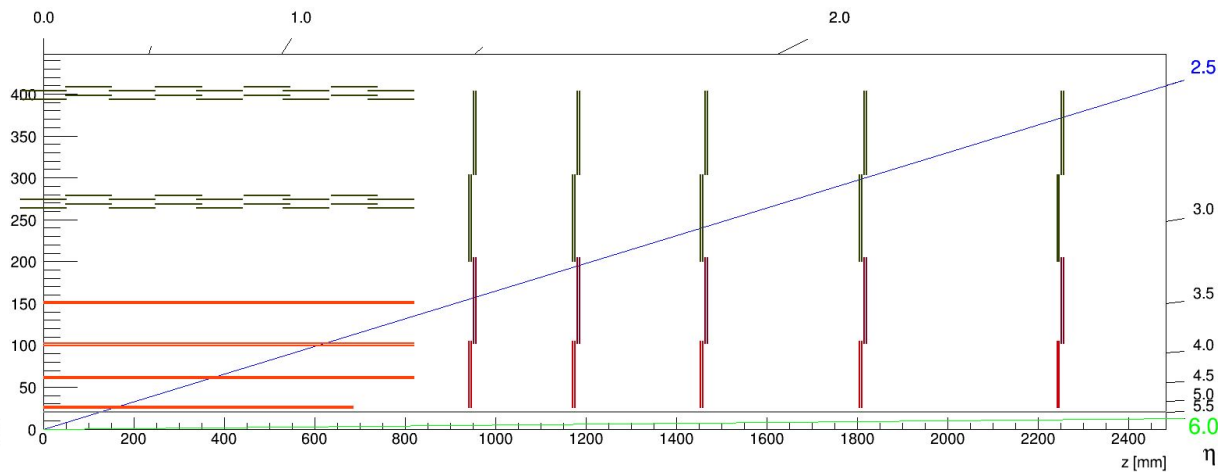
- Allows to add **time filters** at the Doublet level!



Tracker v3.0.3 Seeding Layers

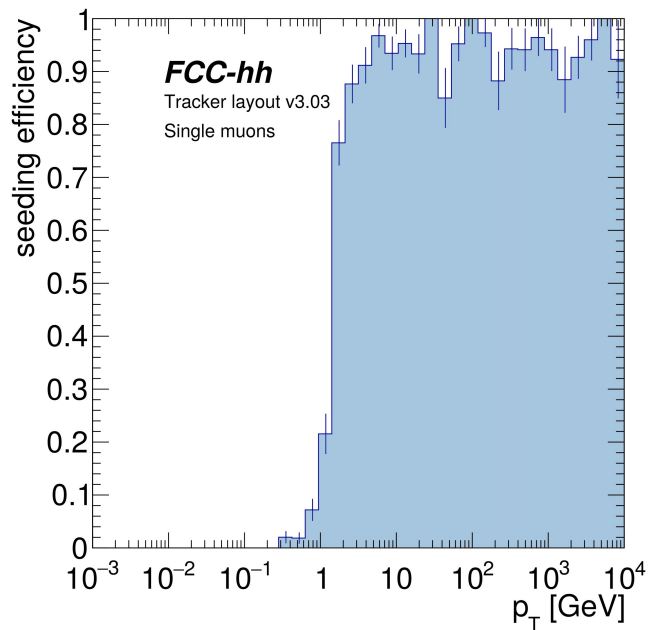


...

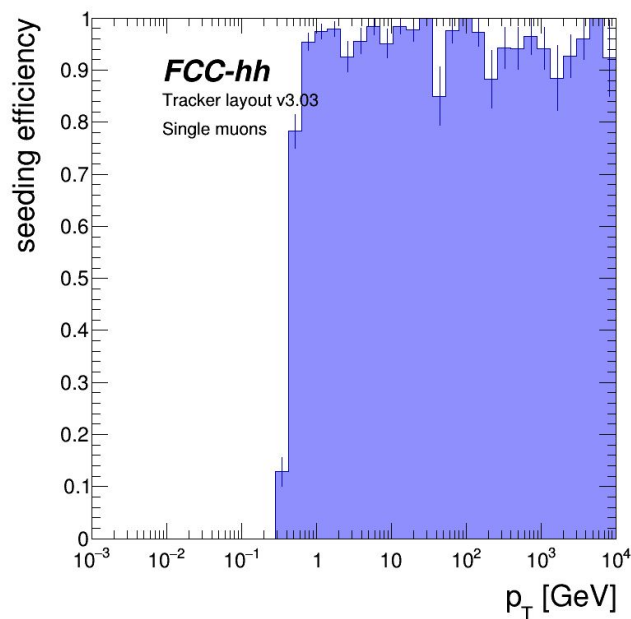


Single Particle Seeding efficiencies

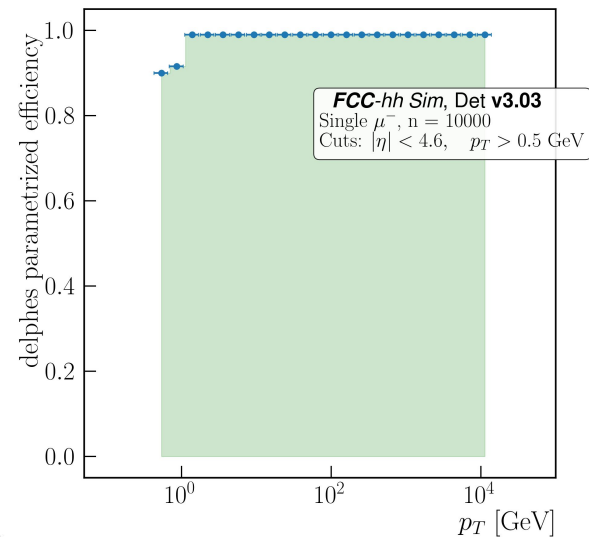
Reconstruct $p_T > 1$ GeV



Reconstruct $p_T > 0.5$ GeV

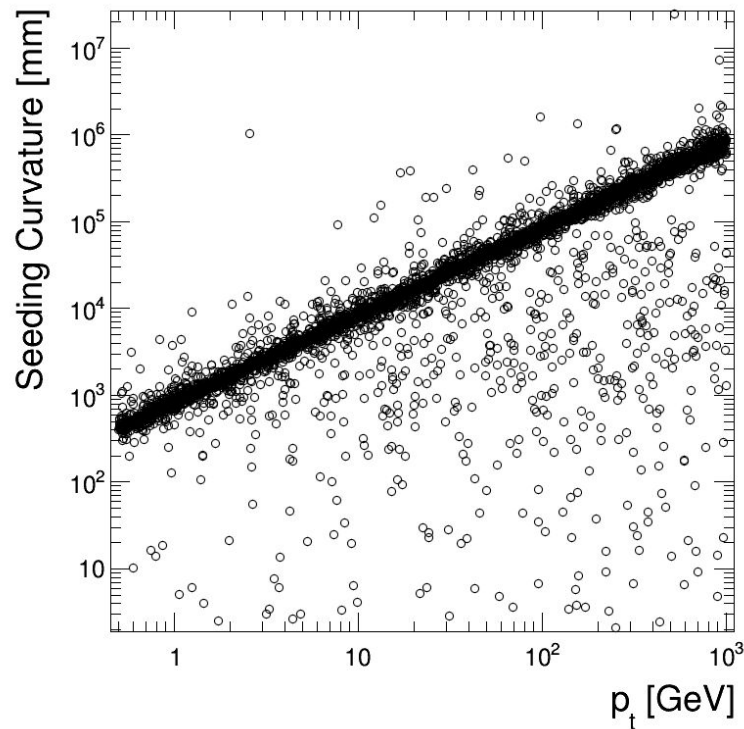
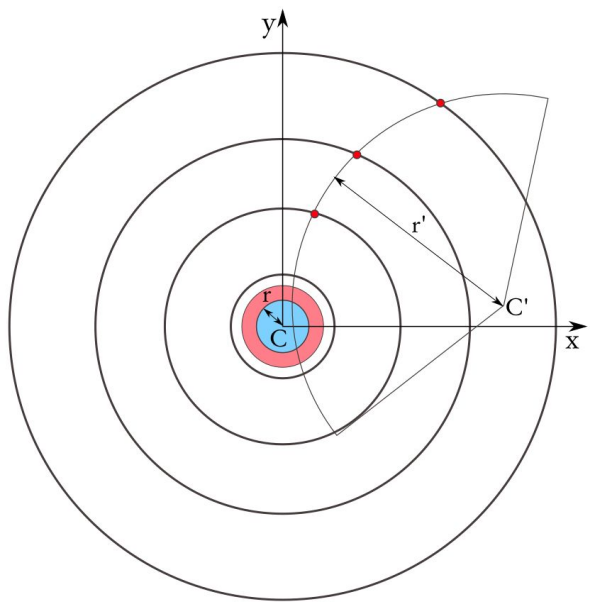


Delphes Parametrisation

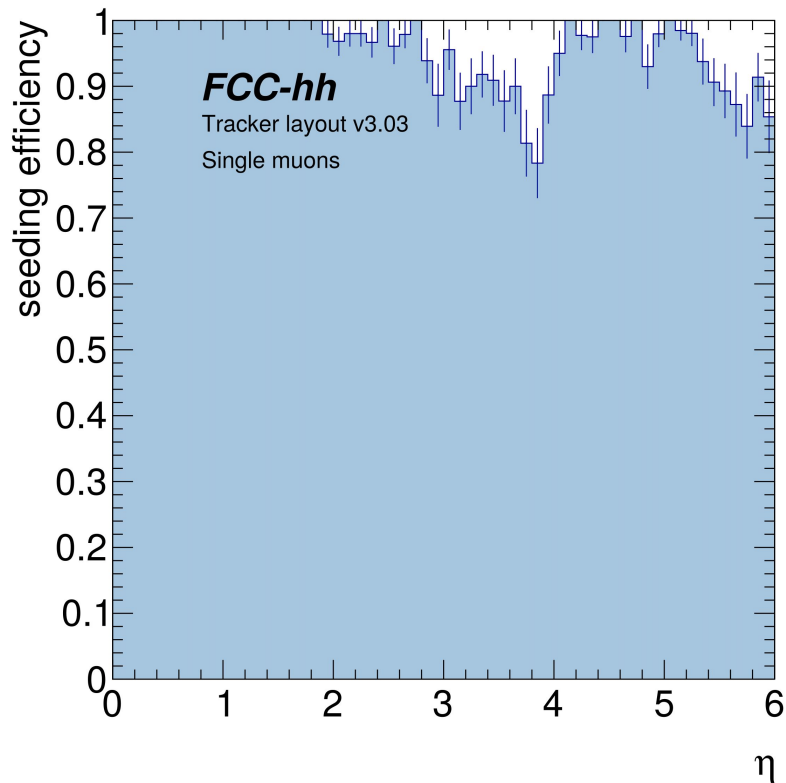


Geometrical Filters - Triplet Level

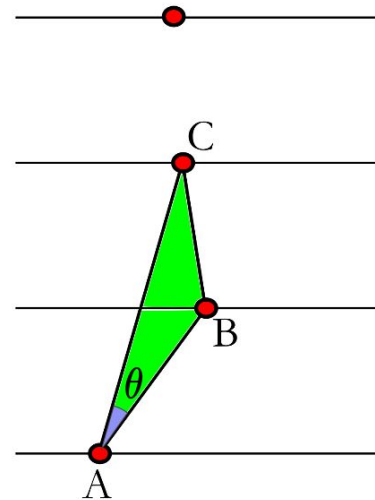
- Track originates from beamspot



Geometrical Filters - Triplet Level

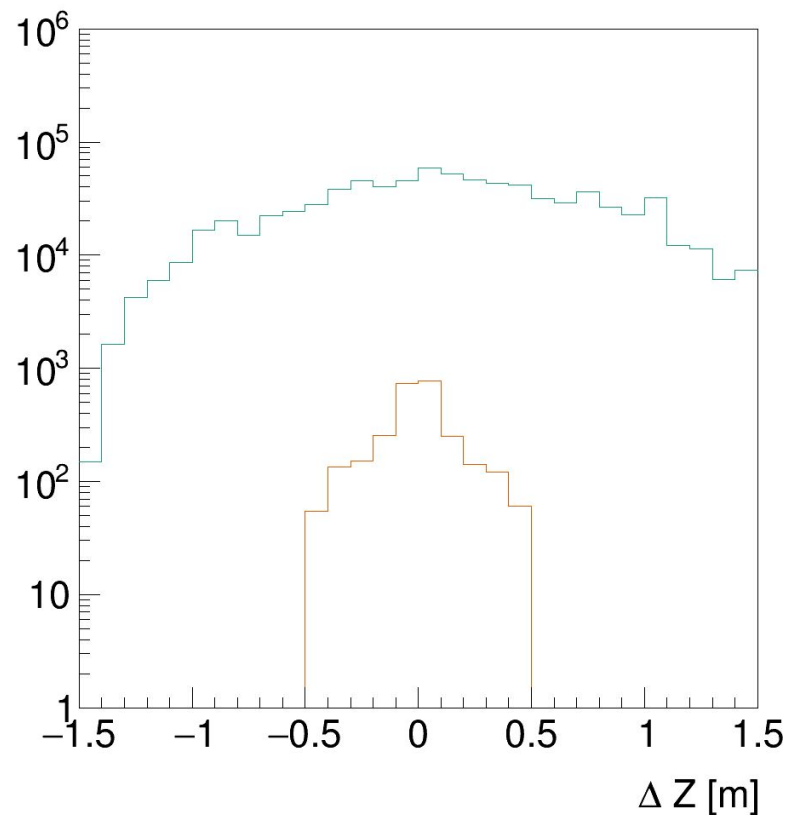
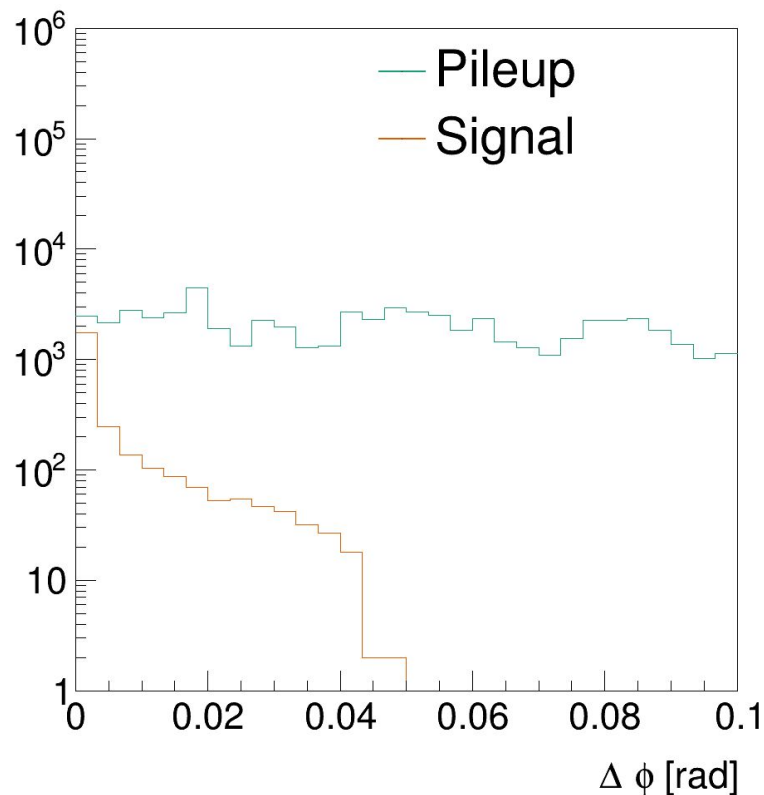


- Track alignment in r-z



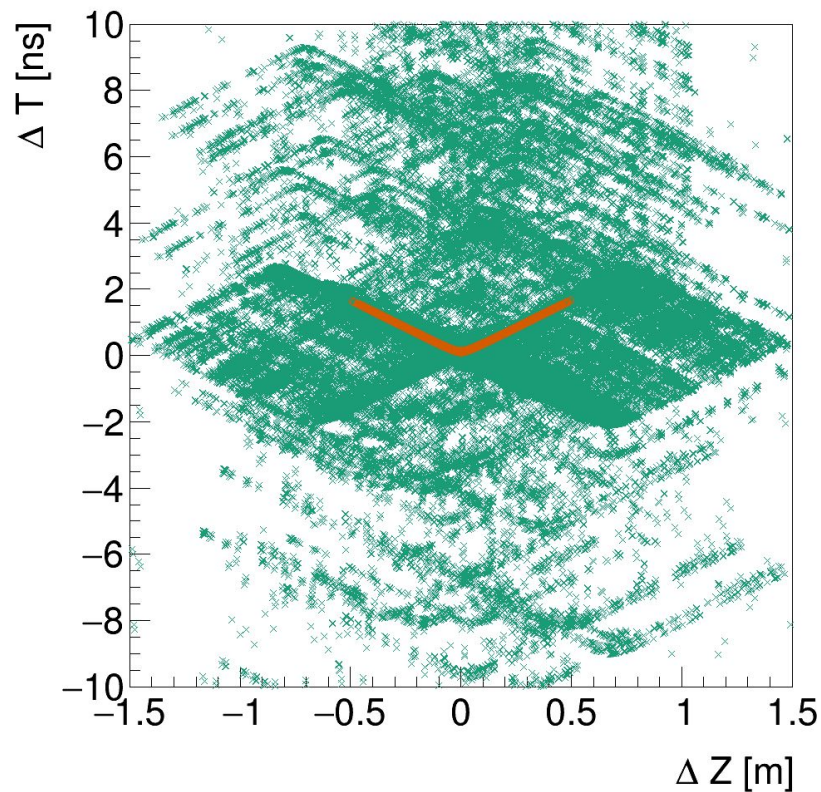
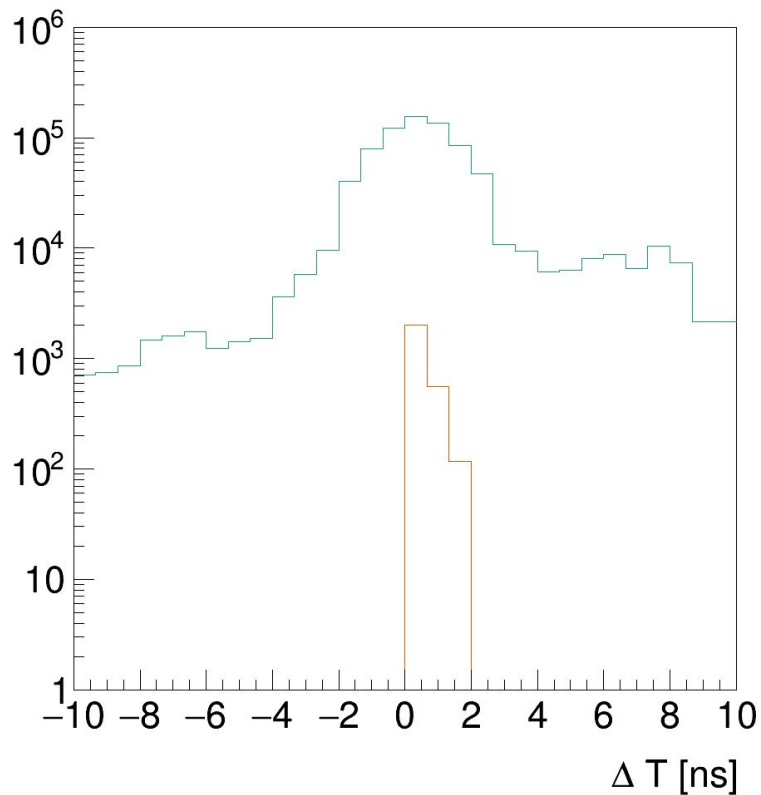
Hit Doublet classifiers

- Compare full combinatorics from pileup to sample of relevant tracks (single muons)



Hit Doublet classifiers

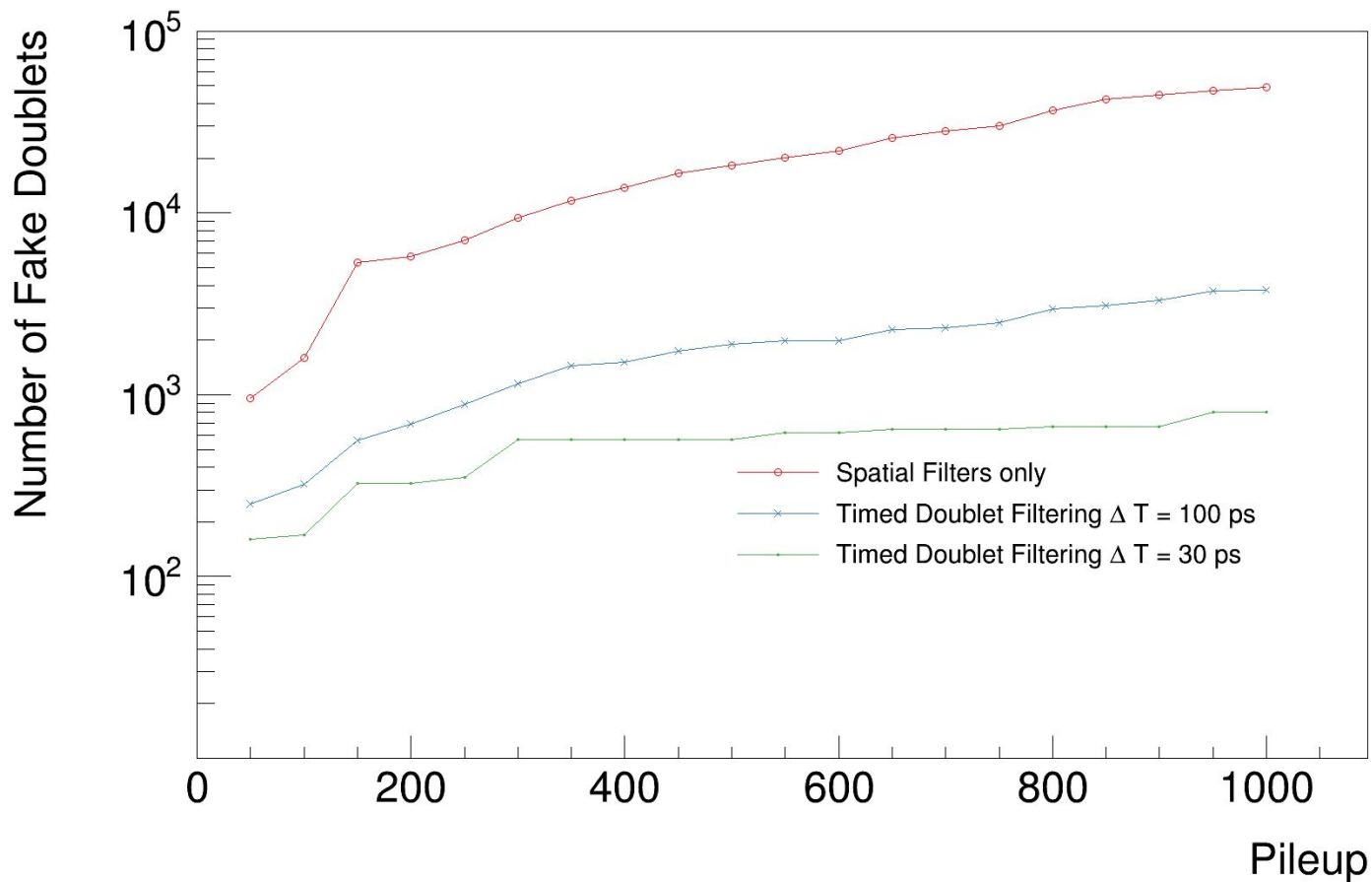
- Compare full combinatorics from pileup to sample of relevant tracks (single muons)



Computing Gains with Time informations

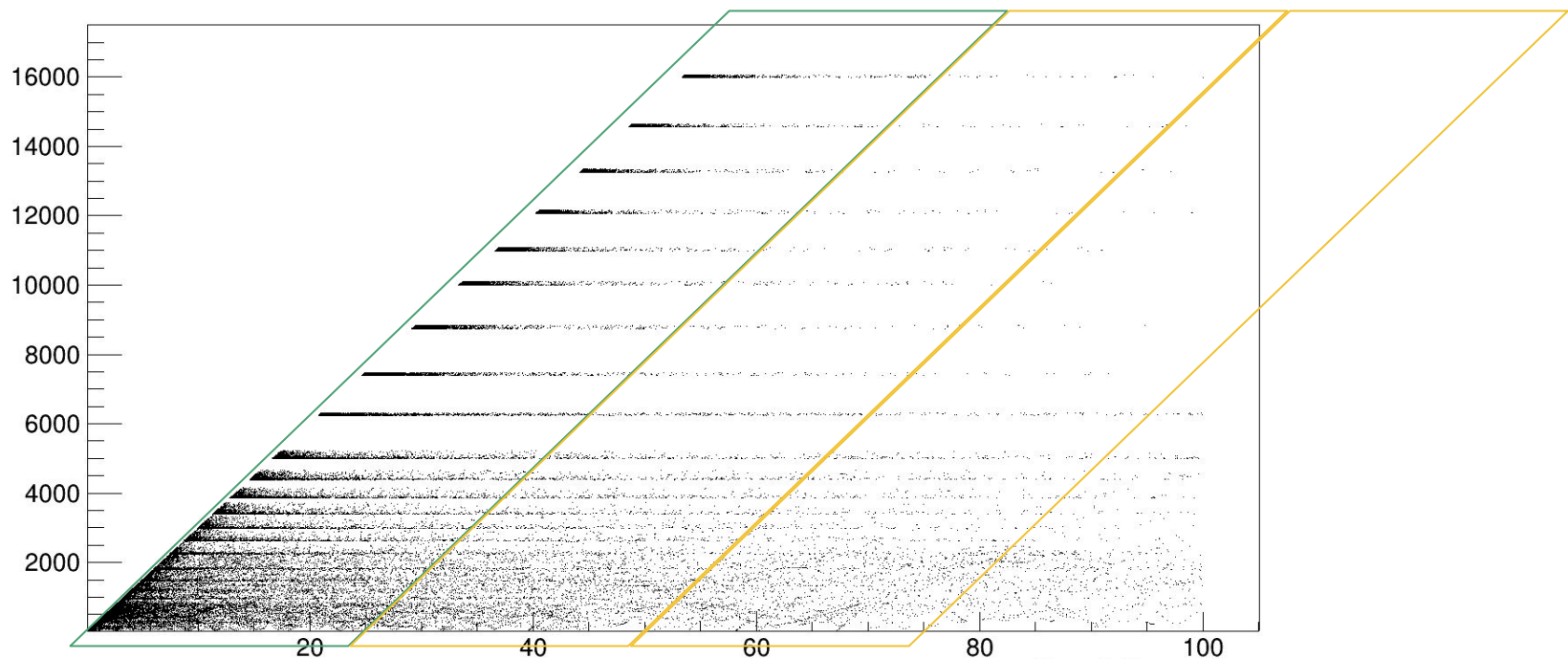
Timing information clearly reduces fake seeds.

Full reconstruction needed to show full potential!



Backup: Out of time pileup

Distance from Origin [mm]



Time [ns]