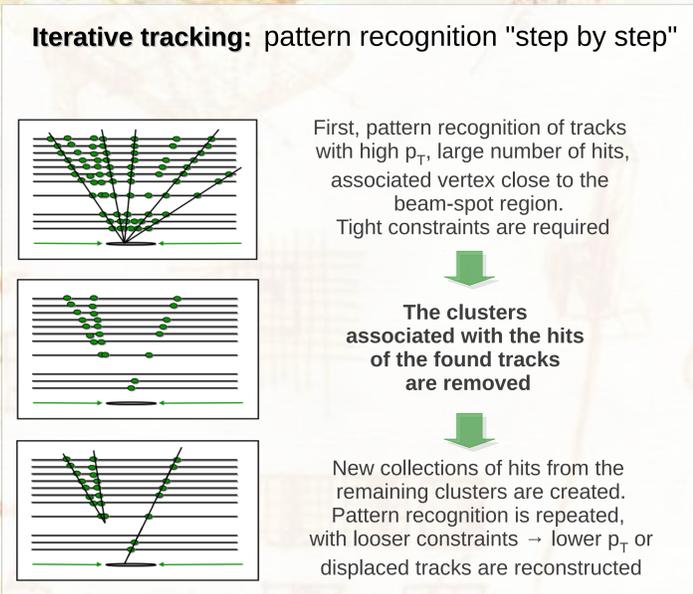
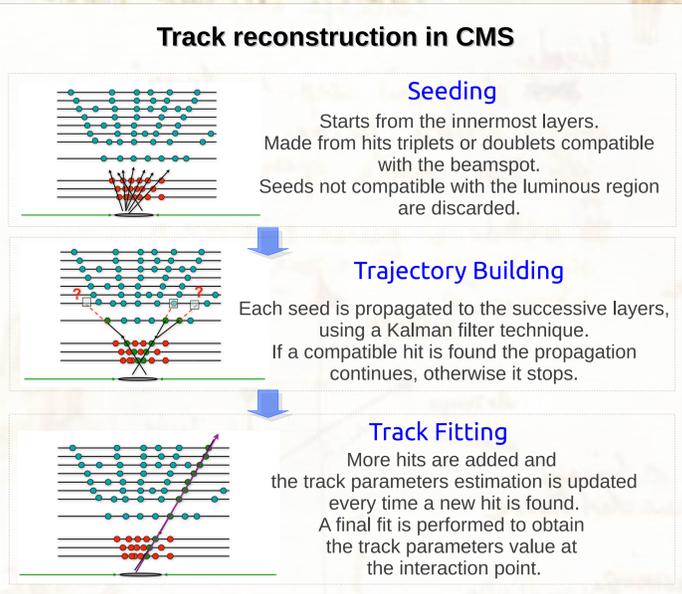
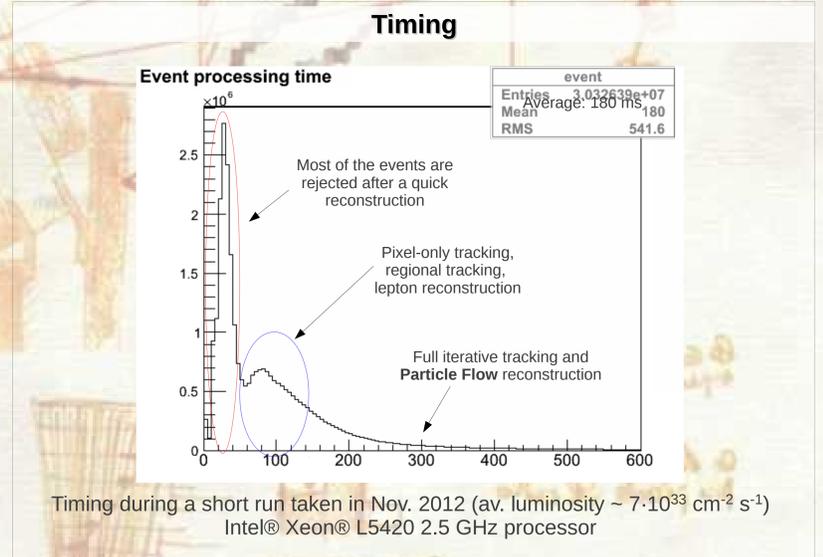
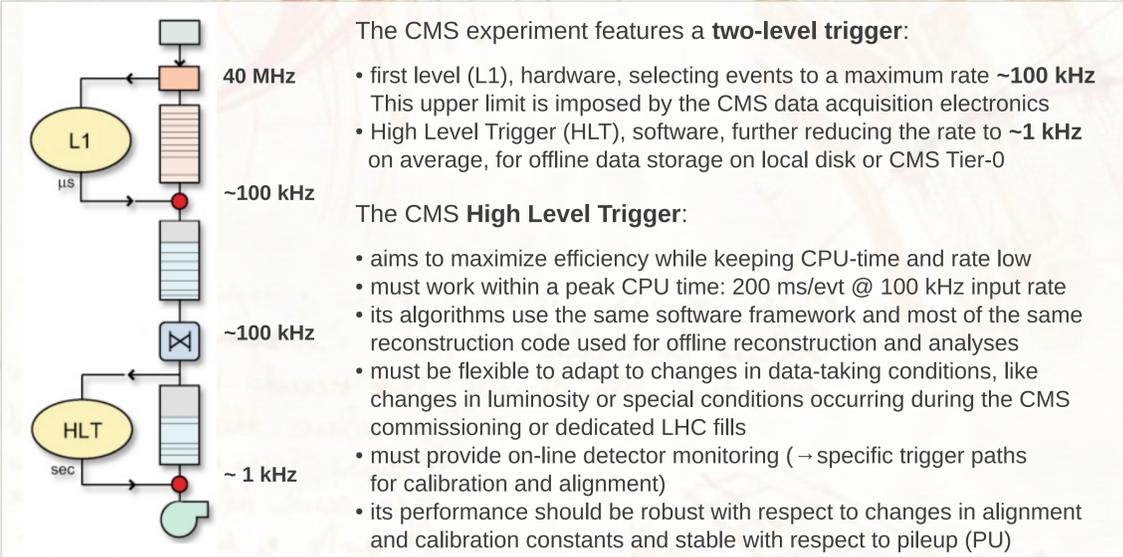


# Performance of the online track reconstruction and impact on hadronic triggers at the CMS High Level Trigger

LHCP, 2nd-7th June 2014, Poster #44



**Tracking at HLT**

**Using reconstructed tracks at HLT:**

- reduces the fake-rate and improves efficiency
- improves isolation in leptonic trigger paths
- reduces the event rate

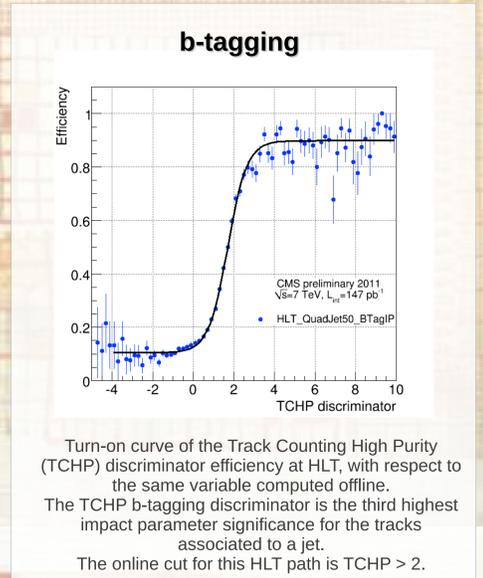
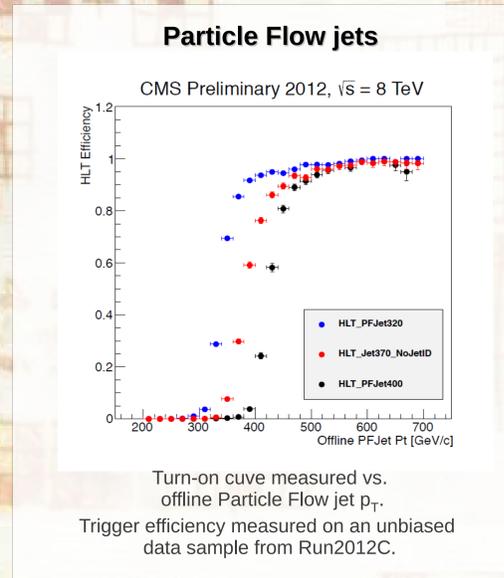
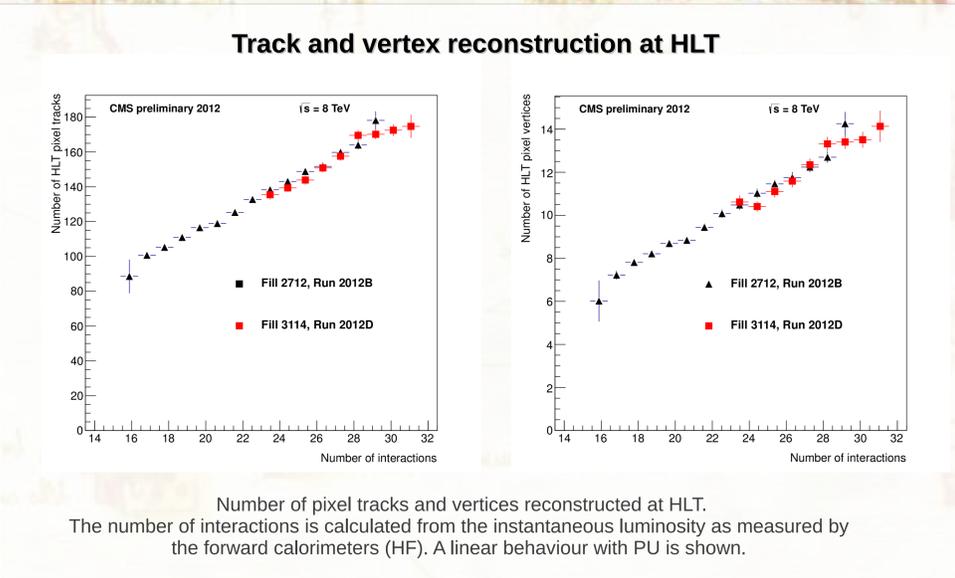
**Using iterative tracking at HLT:**

- reduces the combinatorics  $\rightarrow$  the CPU-time
- allows to have Particle Flow reconstruction at HLT level with better performance

**Better performance for efficiency, fake rate, timing!**

**Iterations:**

- iter0:** prompt tracks with high  $p_T$
- iter1:** prompt tracks with low  $p_T$
- iter2:** recovering of prompt tracks with high  $p_T$
- Iter(3,4):** recovering displaced tracks when needed



## Tracking and vertexing for b-tagging in Run II

The **Fast pixel Primary Vertex (Fast PV)** is an algorithm used to find the Primary Vertex (PV) **before tracking**. It allows to have a first fast reconstruction of the primary vertex, in order to have a constraint for the subsequent reconstruction of PixelTracks used in Iterative Tracking. This reduces the combinatorics and aims to reach better performance. Given a jet ( $p_T > 40$  GeV) the compatible pixel clusters are selected along the jet direction. These clusters are projected along the jet direction onto the z axis. The FastPV is reconstructed from the z position of the highest peak. Once the FastPV is found, full pixel tracking is performed and a pixel primary vertex is reconstructed.

