Impact of tracker layout on track reconstruction with high pileup
G. Cerati, M. Tadel, V. Krutelyov, F. Wuerthwein, A. Yagil

- High-luminosity LHC operations are expected to be with mean pileup up to 200
- CPU cost of charged particle tracking is a significant fraction of total computing cost and is comparable to tracking detector construction cost
- Fast track pattern recognition can replace Kalman-filter based one, which is used in traditional tracking and is responsible for over 1/2 of tracking time
- Tracker layout with grouped layers can improve tracking: faster pattern recognition from reduced combinatorics; improve locality for parallel execution

High pileup

Faster tracking: segment linking

Tracker and tracking costs

Grouped layer layout

Impact of grouped layer layout

Combinatorial problem in Tracking

Grouped layer layout is expected to reduce computing costs, with substantial impact for tracking outside the (inner) precision pixel detector