



PileUp mitigation in HGCal

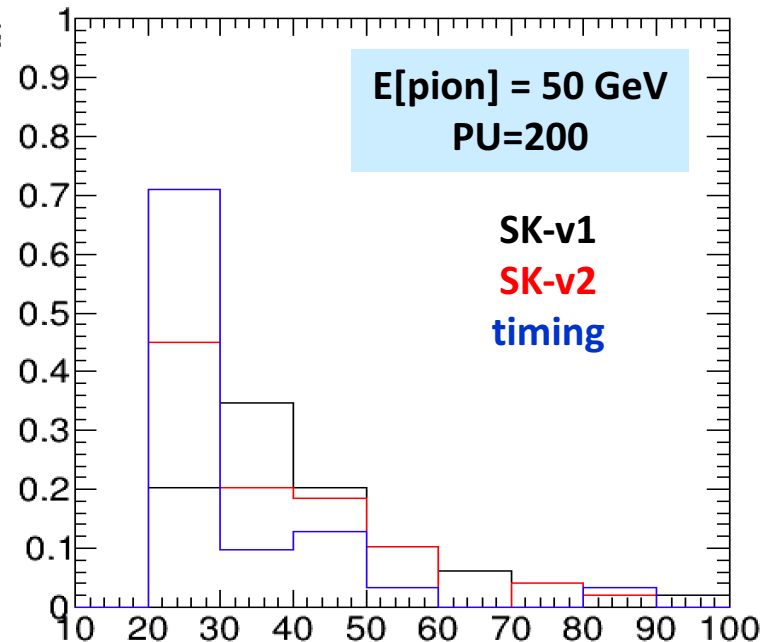
7th Patatrack Hackathon

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- **Reminder:** First two days we developed a method based on the “softkiller” technique to remove pileup particles
 - ◆ **I.e. softest particles in the event up to a eta & layer dependent p_T threshold**
 - Still working on the tuning

- **Today:**
 - ◆ **Exploit timing information available for Layer Clusters [LC]**
 - Typically LC from PU should have values below the corresponding threshold
 - “Quick & dirty”: If there is no time-meas
 - Clearly too aggressive ..
 - ◆ **Linking between Tracksters:**
 - First try a simple topological selection
 - Work in progress [cont. tomorrow]

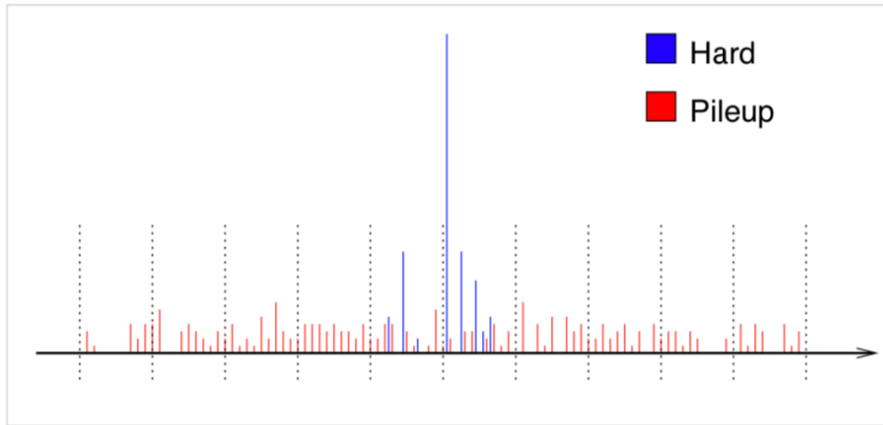
- **Goals for tomorrow:**
 - ◆ **Finalize tuning + put all pieces together and quantify performance**



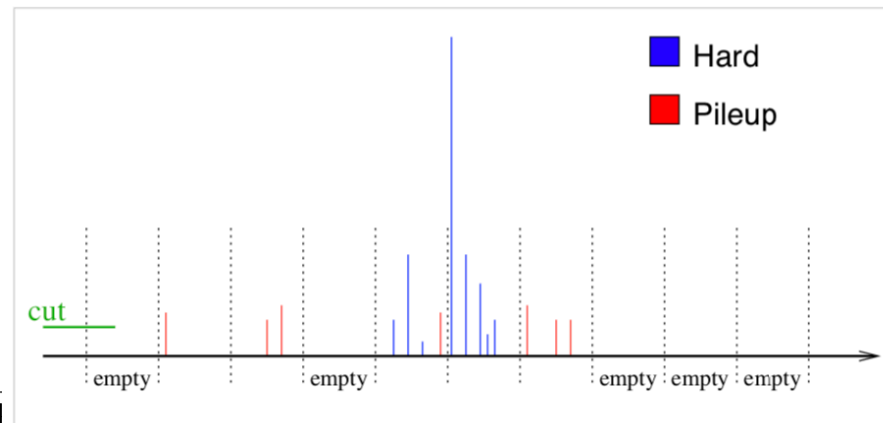
- Main focus for Day 2:
 - ◆ Detailed studies of the “softkiller” approach in the context of HGCAL
 - eta-dependent particle removal: small improvement ~5% on response
 - Still far from optimal for low-energy pions [~20-50 GeV]
 - ◆ Set up machinery to include timing information for the layer clusters
 - mainly coding -> not plots for today
- Goal for Day 3:
 - ◆ Exploit information from these two methods and present some first performance plots

- First approach using an approach inspired from “Softkiller” [1407.0408]
 - ◆ Particle-level based pileup correction
 - ◆ Removes softest “particles” in the event up to a p_T -threshold that is determined dynamically for each event

Original event



After SoftKiller



- Goals for day1:

- ◆ set up the machinery for this study
- ◆ Very preliminary implementation in place

