Highlights: Development and performance of track reconstruction algorithms at the energy frontier with the ATLAS detector

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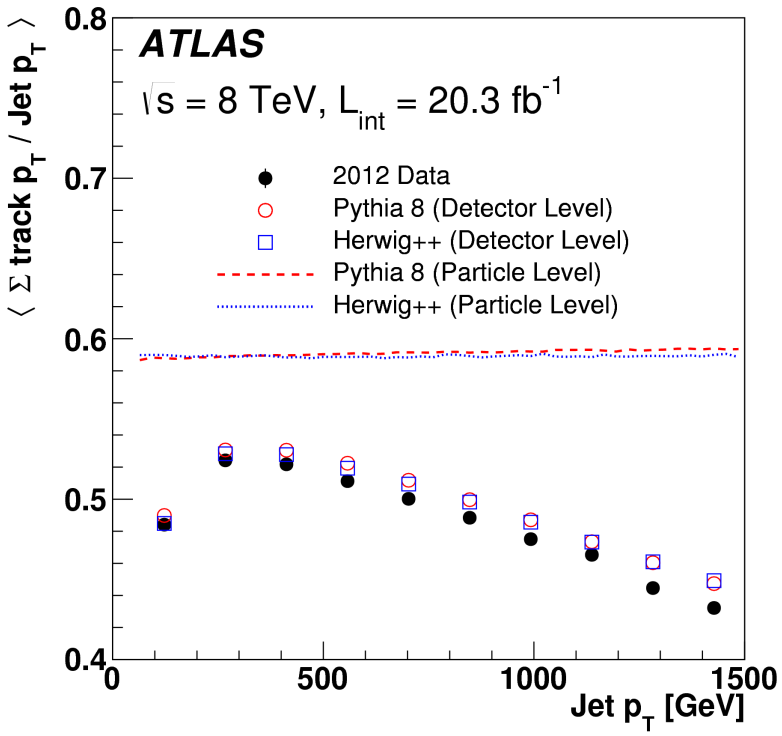
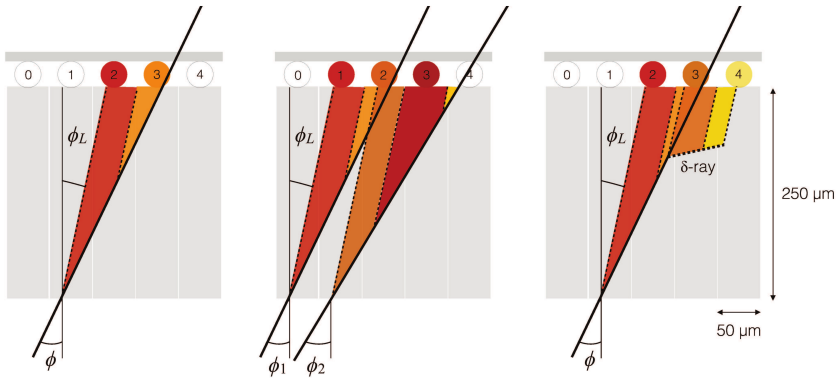
Tracking in dense environments

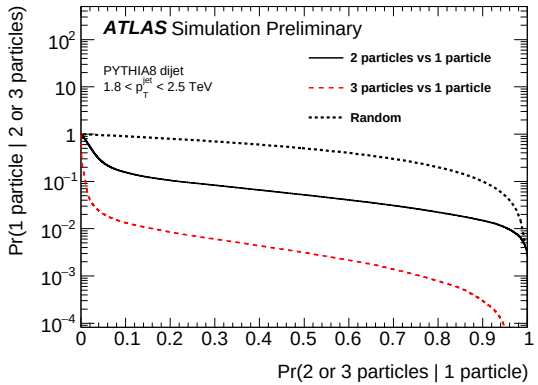


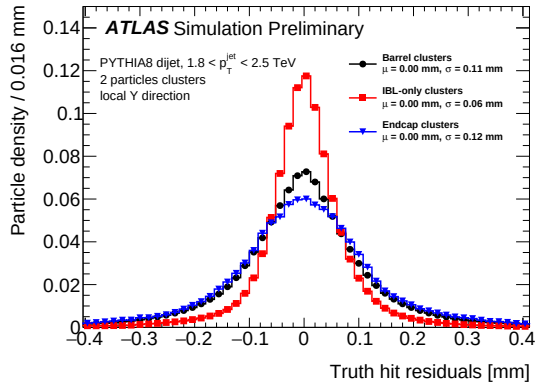


- Charged particles typically deposit charge in > 1 pixel or strip per layer
- dense environments: distance between particles close to detector granularity
  - e.g. high-pt b-hadron, τ decays or top quark jets
- Charge clusters can merge
- High $\sqrt{s} \rightarrow$ more dense environments $\rightarrow$ difficult tracking!
- figures: [STDM-2014-17], [1406.7690]

Tracking in dense environments

- Use neural networks to estimate number of charged particles in clusters, measure the hit positions and associated errors





- Measure fraction of lost tracks in dense environments with single-particle clusters dE/dX fit using single- and multiple- particles templates