Comparison of Two Unfolding Approaches

Jan Lochman

Czech Technical University

jan.lochman@cern.ch

Inclusive Jet Meeting

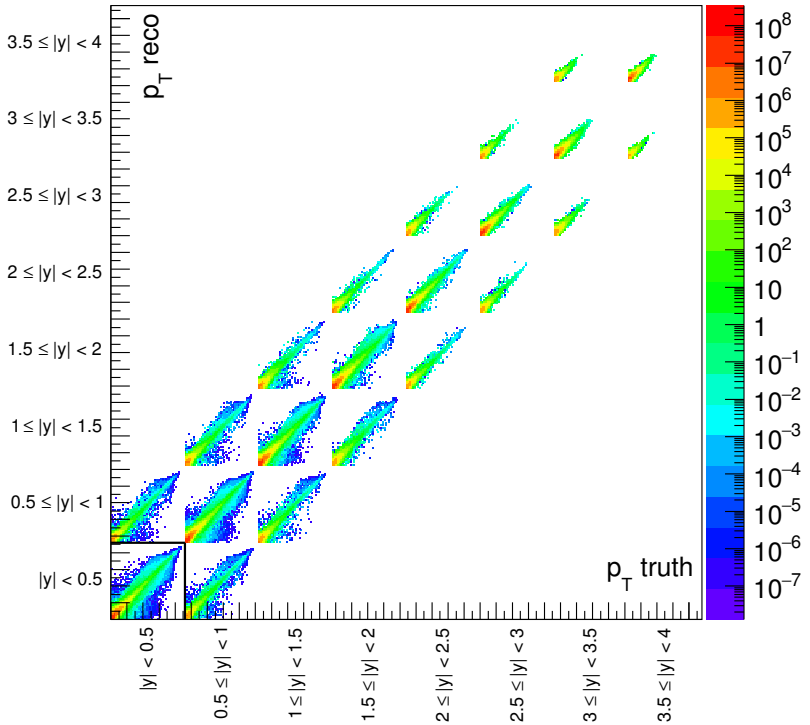
April 20, 2015

Intro to Unfolding

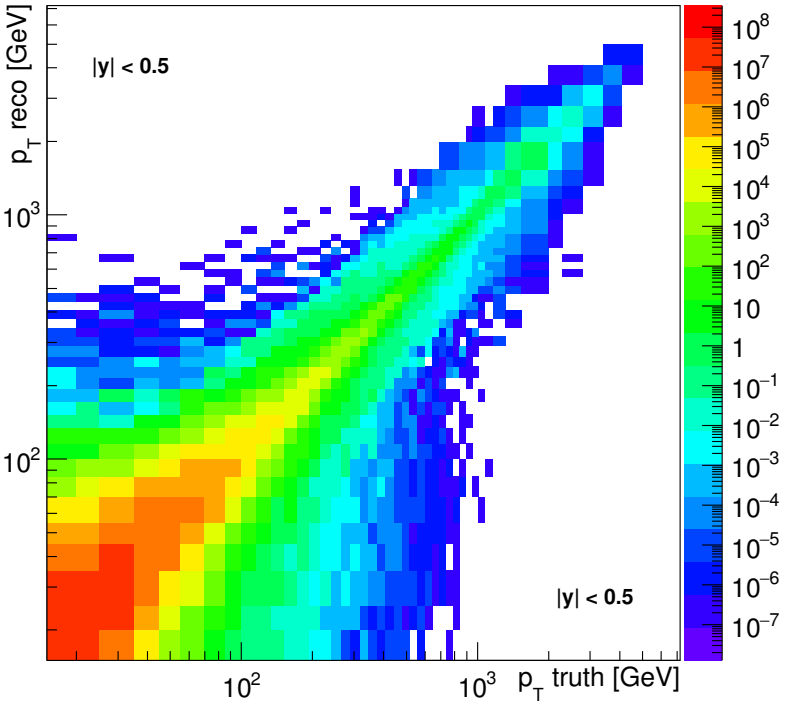
- Used two approaches to unfolding
- **Simple Unfolding**
  - Matching only within the same rapidity bins.
  - 8 transfer matrices 46x46 (8 = # y-Bins, 46 = # p_T-Bins).
  - Unfolding done for each transfer matrix separately.
- **2D Unfolding**
  - Matching between different rapidity bins allowed.
  - 1 transfer matrix 368x368 (368 = 8x46).
- **Differences:**
  - Different transfer matrices.
  - Different matching efficiencies.

Transfer matrices

2D unfolding



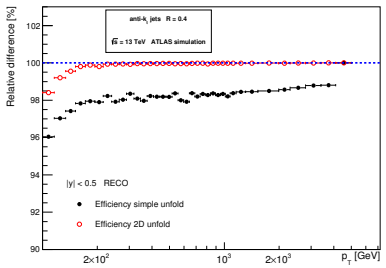
Simple unfolding

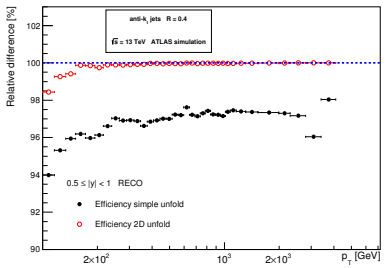


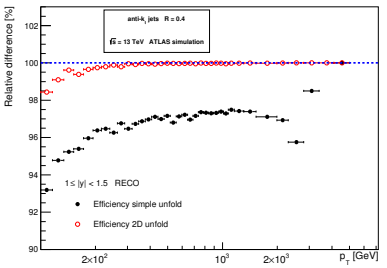
Slices in Transfer Matrix

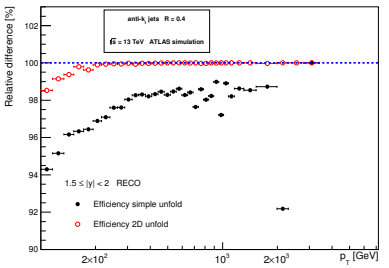
Matching Efficiencies

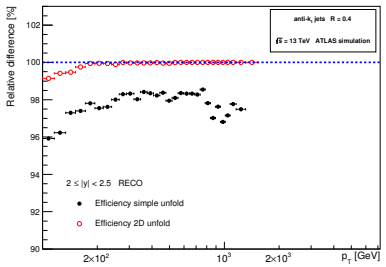
Reco Jets

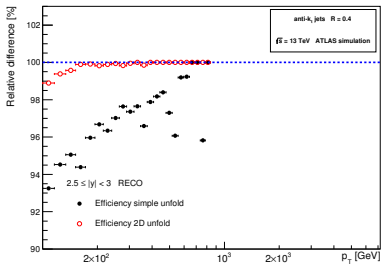


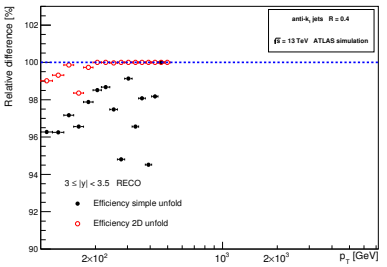


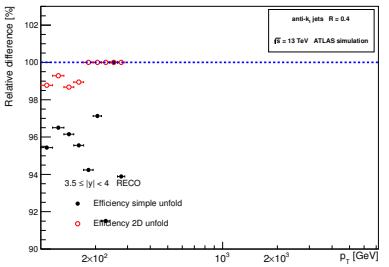




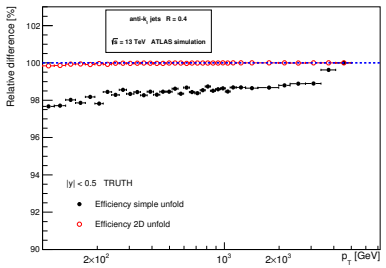


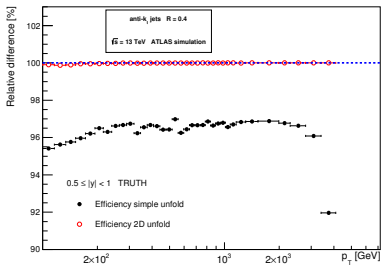


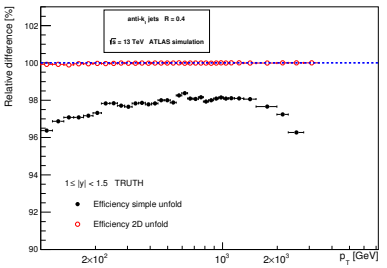


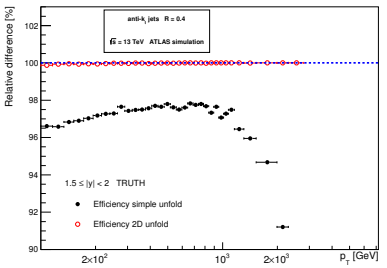


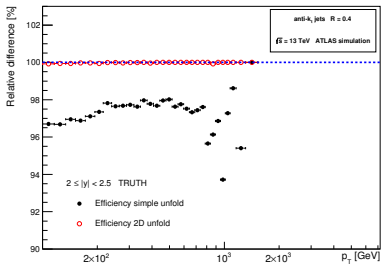
Matching Efficiencies
Truth Jets

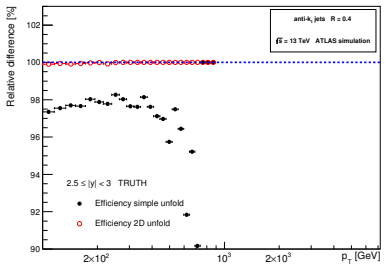


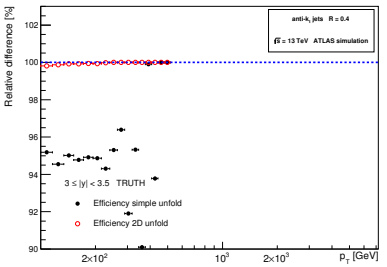


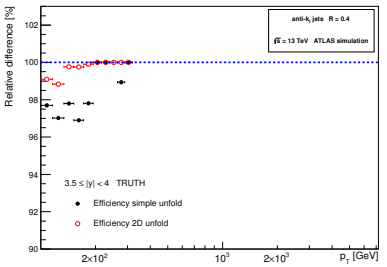






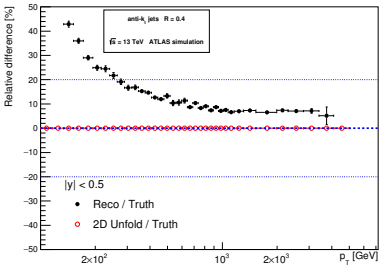


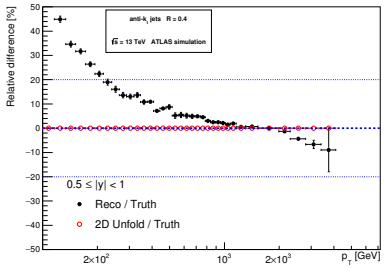


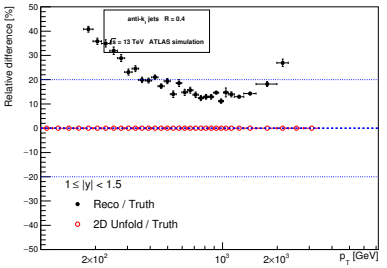


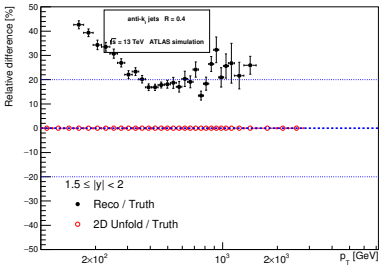
Unfolding Results

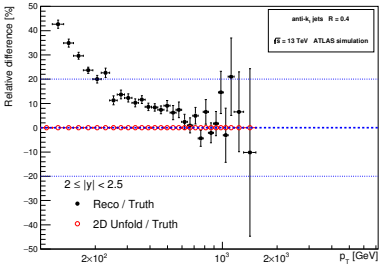
Reco Spectra & 2D Unfolded Spectra / Truth Spectra

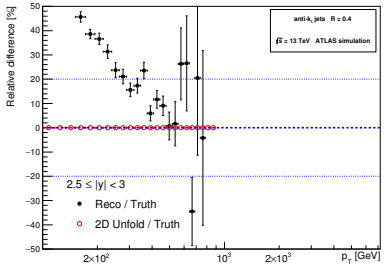


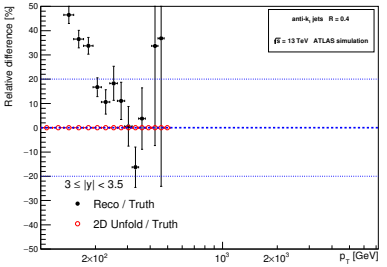


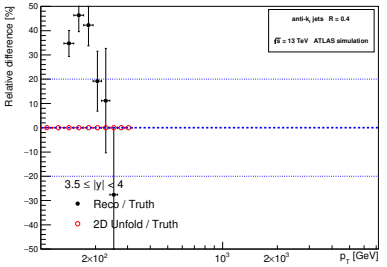






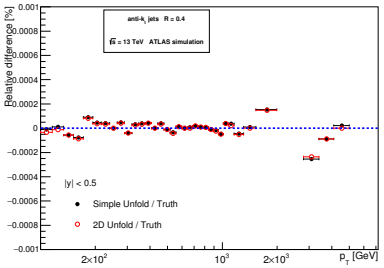


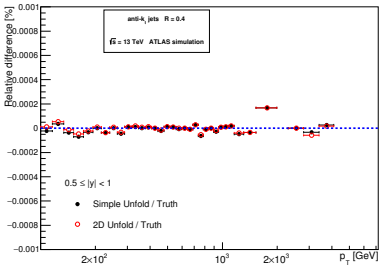


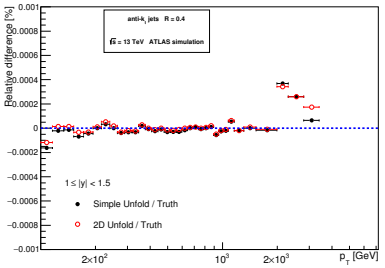


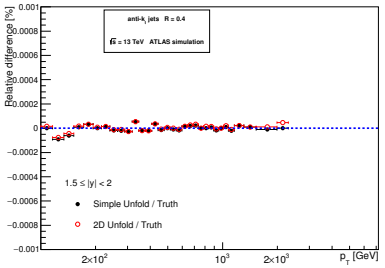
Unfolding Results

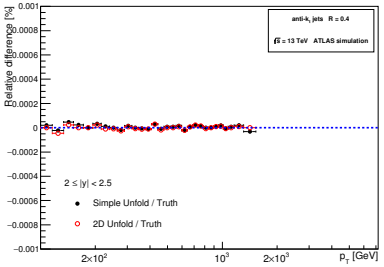
Simple Unfolded Spectra & 2D Unfolded Spectra / Truth Spectra

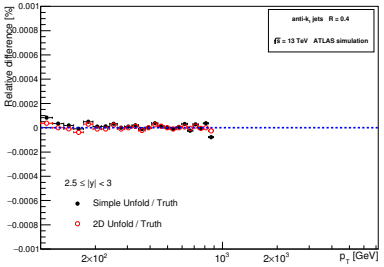


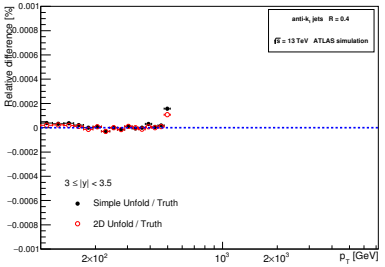


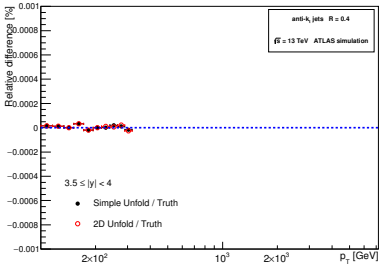












Conclusions

Matching Efficiencies

2D Unfolding: $> 99\,\%$ for almost every bin with $p_T > 100\,\mathrm{GeV}$.
Simple Unfolding: $\sim 2 - 5\,\%$ worse.

Unfolding Results

Small differences between both of these approaches.