Jets in common Ntuples

(High-x analysis technical study)

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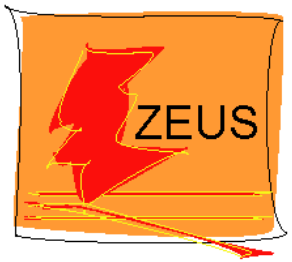
ZEUS Analysis Forum

December 11, 2018



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History

- Earlier high-x analysis was done with private MC ntuples with lower statistics of Monte Carlo events
- Extension of high-x analysis required more MC events
- First attempt to generate more events was done this summer with generation(funneling) of $v06b$ Commonn ntuples from available input files
- Comparison to private ntuples has shown that not everything was OK with new samples...

What was wrong

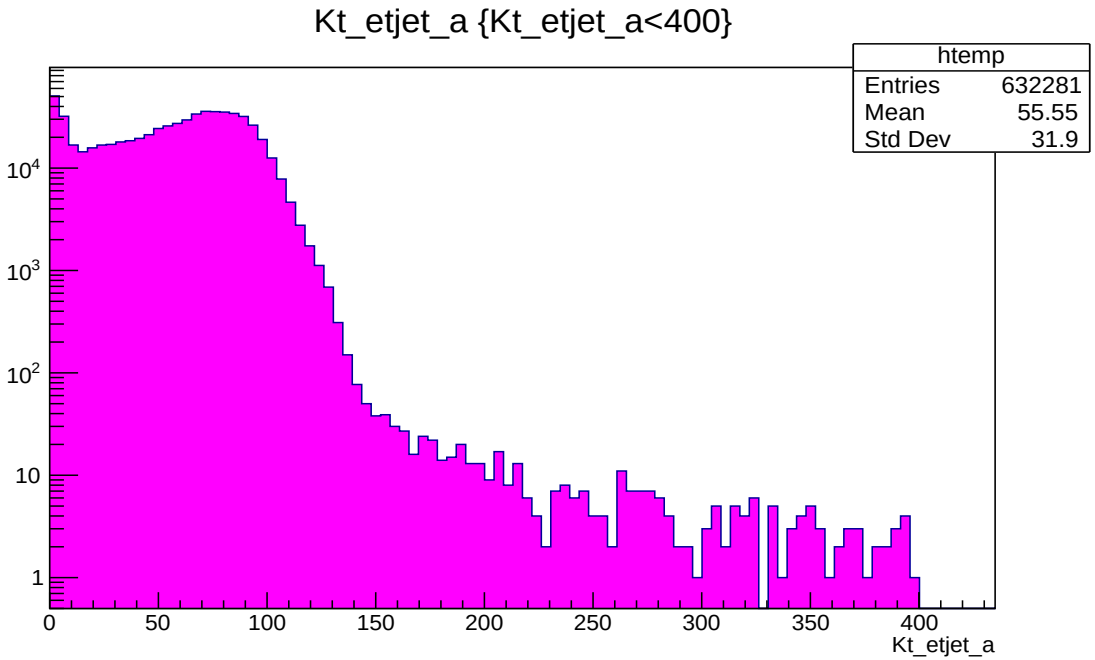

Figure: Distributions of E_T of jets from MC Common Ntuples *v06b*. k_T jets reconstructed from ZUFO objects.

- Note: same input files processed with same executables but with private cards from Ritu were perfectly OK. See talk from Ritu on previous ZAF.

Debug

The debug has revealed at least two sources of high E_T jets:

- Very high momenta MVD standalone tracks produce very energetic ZUFOs.
- Very high momenta muons produce very energetic ZUFOs.

For both cases the uncertainties on the track momenta are huge, however these are neglected in jet algorithms.

Conclusions and Solution

MVD standalone tracks and high energy muons influence ZUFO-based analyses (e.g. event shapes, jets, etc.). Two solutions are available:

- Selection of ZUFOs and reconstruction of jets/ES. Option recommended for new analyses. Previous QCD analyses did not had this problem, so new selection should care about it.
- Rerun MC with cards from Ritu. **Done for high-x analysis.**

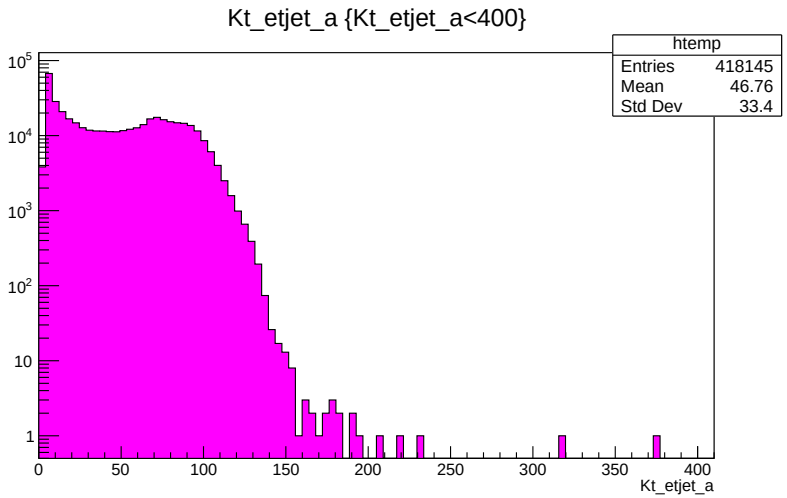

Figure: Distributions of E_T of jets from MC Common Ntuples $v06b$ ($\approx$ Ritus cards). k_T jets reconstructed from ZUFO objects.

Backup slides

Other approaches

One could try to eliminate eliminate bad events, for instance

- Maximal total energy of MSA tracks 50GeV, maximal individual p_T of MSA track 25GeV
- Maximal total energy of muon tracks 1000GeV, maximal individual p_T of MSA track 50GeV

Selection fails due to huge uncertainties on the MSA and/or muon momenta.

MSA tracks in events with high-E_T jets

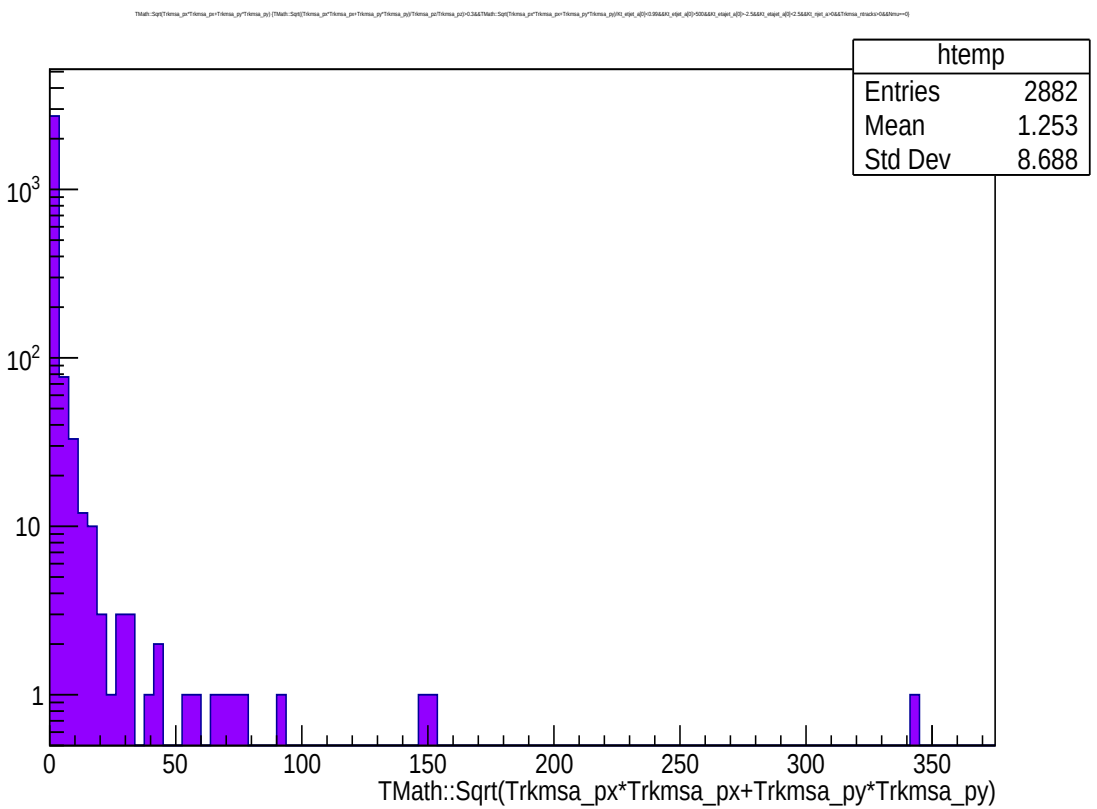

Figure: Distributions of p_T of MSA tracks from MC Common Ntuples $v06b$. k_T jets reconstructed from ZUFO objects. Selection: p_T of central MSA tracks in events with $E_T > 500GeV$ central jets.