x_E distribution : pp at 7 TeV
Efficiency estimation

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Status :

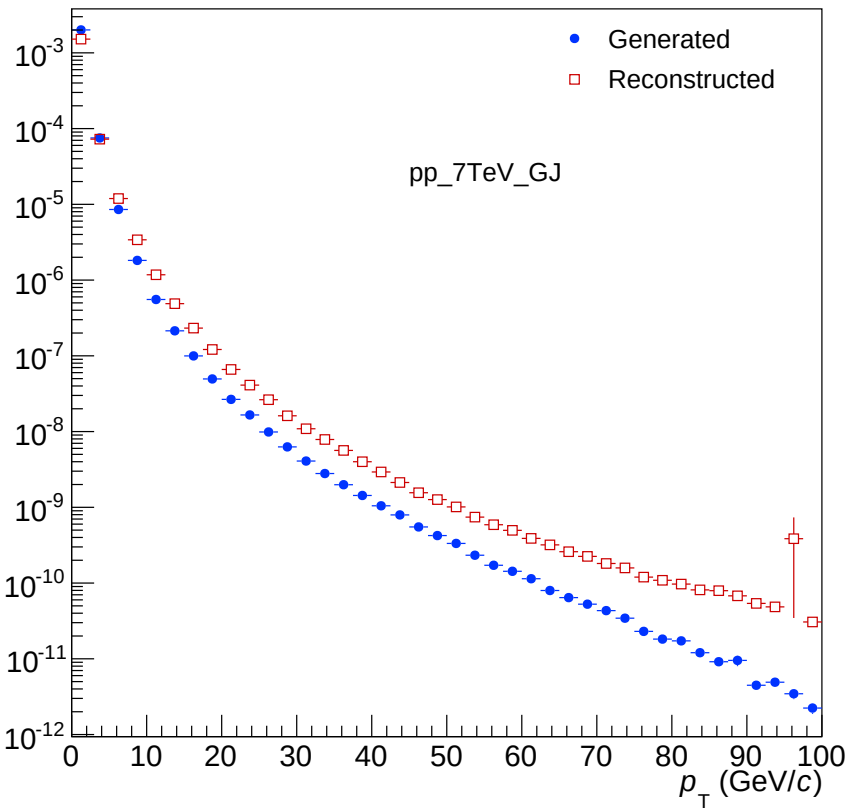
- Review the analysis code : done
- Review the purity macros : done
- Review x_E macros : to do (changes with the x_E formula have to be implemented)
- Efficiency issues : ongoing

Efficiency vs $p_T^{h^\pm}$: 1/3

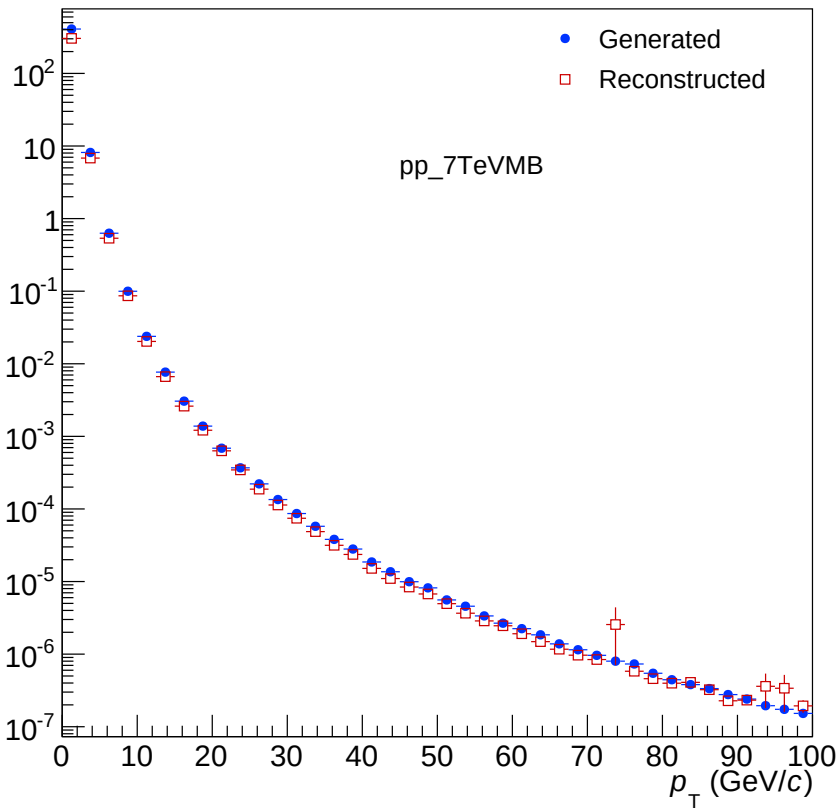
- Before my holidays : I was not sure to use the right histograms for the generated and the reconstructed spectra
  See presentation of 07-17-2014
- Now : I'm sure I didn't use the right histograms
- I still have troubles with the efficiency for some simulation

Efficiency vs $p_T^{h^\pm}$: 2/3

generated p_T distribution from $\pi^\pm$

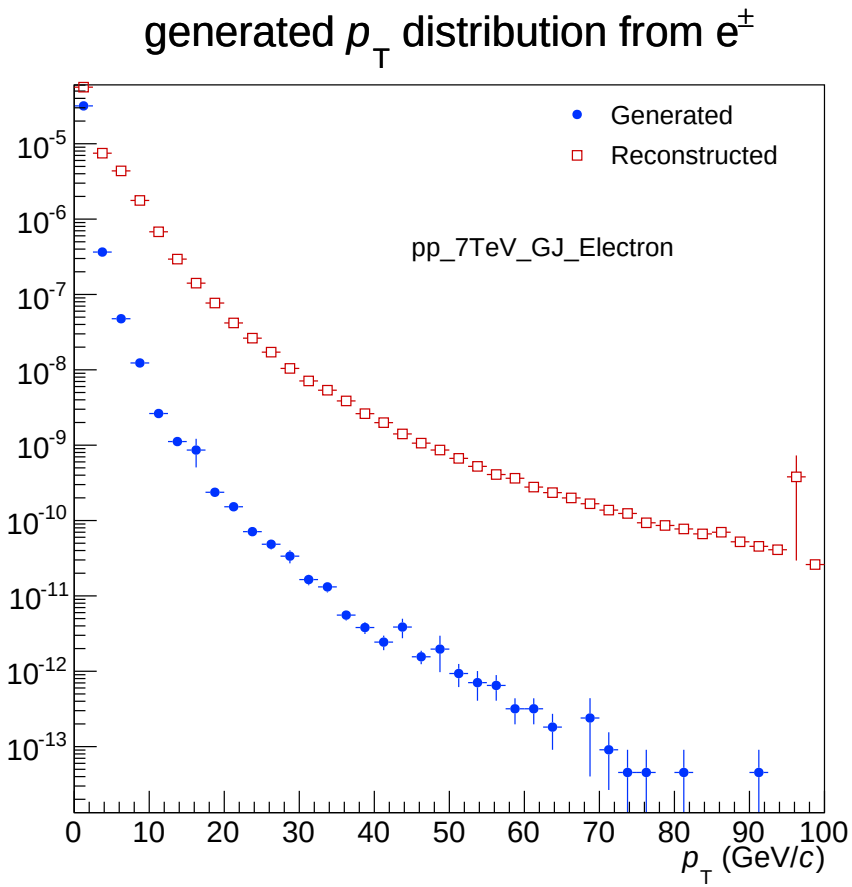


generated p_T distribution from $\pi^\pm$



Efficiency vs $p_T^{h^\pm}$: 3/3

- Issue du mostly to the conversion electrons
  $\Rightarrow$ maybe we don't have the good histograms to obtain the efficiency for now



Efficiency : What defintion ?

- The efficiency should be $\epsilon = \frac{N^{data}_{seeindetector}}{N^{data}_{true}} = \frac{N^{simu}_{propagate}}{N^{simu}_{true}}$
- The question is to know what's in $N^{simu}_{propagate}$ and N^{simu}_{true} $\Rightarrow$ how do we deal with the conversion electrons, ghost tracks, etc ...
- For instance the histograms available in the simu files are (only x_E for now) :
  - fhXEChargedMC : seems to be the truth
  - fhMCPtXECharged : filled only with charged tracks that does not come from conversion (seems to be the propagated histogram)
- For the data : the x_E histogram apparently take into account the conversion electrons
- How do we decide to define our efficiency ?

x_E formula

- Taking into account all the contributions we obtain this formula : (see note on *cebaf/vauthier/AnalyseCorrelGH_pp7TeV/xEDistribution*)

$$f(x_E)^{\gamma} = \frac{1}{\sum_i p_i N^{clusters}_{trig,i}} \sum_i \left[p_i N^{clusters}_{trig,i} \alpha^{away}_{corr,i} \left(\frac{1}{p_i} f(x_E)^{clusters,i}_{tot} - \frac{1-p_i}{p_i} \left\{ r_{\pi^0,i} f(x_E)^{\pi^0,i}_{tot} + (1 - r_{\pi^0,i}) \left[(1-\delta_i) f(x_E)^{\gamma_{paired},i}_{tot} + \delta_i f(x_E)^{\gamma_{single},i}_{tot} \right] \right\} \right) - \alpha^{UE}_{corr,i} f(x_E)^{UE,i} \right]$$

- For now all the needed histograms are not available : working on that

To be done

- Change analysis code to have all the needed histograms for the efficiency and the x_E distribution
- p_T^{trig} bin dependance of the efficiency
- α_{corr}^{away} vs α_{corr}^{UE}
- p_T^{trig} bin dependance of r_{π^0} and δ
- Obtain the x_E distribution