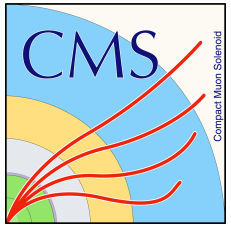
Weekly Report
NTUA
10/4/2020

George Bakas



Status Report

- Analysis:
  - Unfolding:
    - Rebin in the reco level:
      - Reco bins ≈ 2 x Parton/Particle Bins
      - Merge bins at the edge of phase space (jetPt1, ptJJ, mJJ)
    - Unfolding using MC (closure test)
      - Parton level
      - Particle level
    - Unfolding implementing the “Minimum of global Correlation”
    - Unfolding Errors
      - Calculation before and after unfolding

Minimum of global Correlation

Trying to solve the inverse problem of $y = Ax \rightarrow x = A^{-1} y$ where:

- x: Extrapolated to Parton
- A is the response matrix
- y: reco input
- V_x is the covariance matrix of x

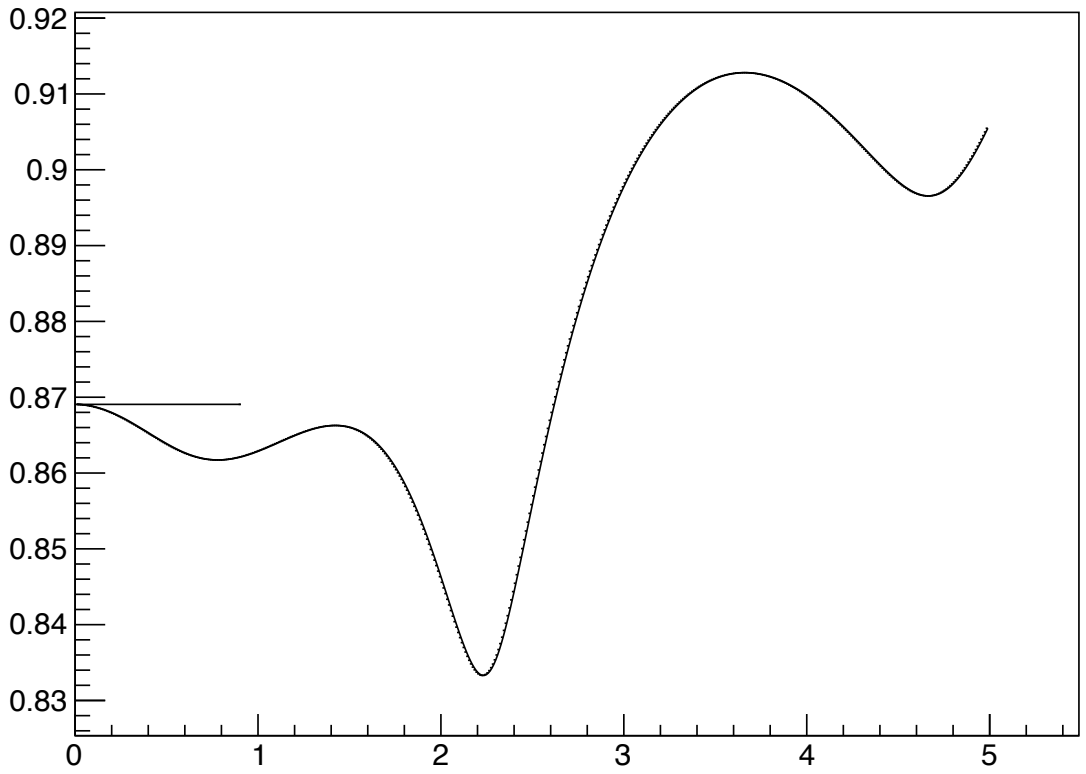
This method finds the minimum mean value of global correlation coefficients (ρ_j):
Where ρ_j is defined as:

$$\rho_j = \sqrt{1 - [(V_x)_{jj} \cdot (V_x^{-1})_{jj}]^{-1}}, \quad where \;\; 0 \leq \rho_j \leq 1$$

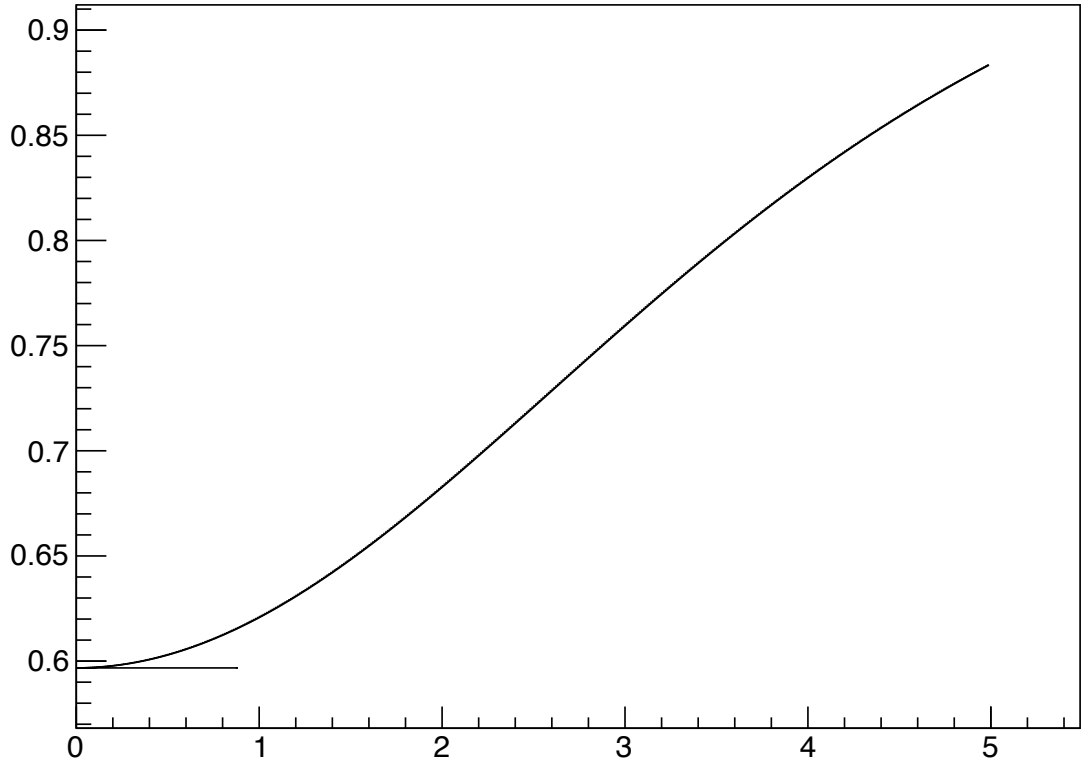
1. The global correlation coefficient is a measure of the total amount of correlation between element j of x and all other elements.
2. The arithmetic and the geometric mean of all n global correlation coefficients is determined for a large range of τ-values.
3. The τ-value with the smallest mean value is accepted.

Minimum of global Correlation (MC Parton)

Leading Jet Pt



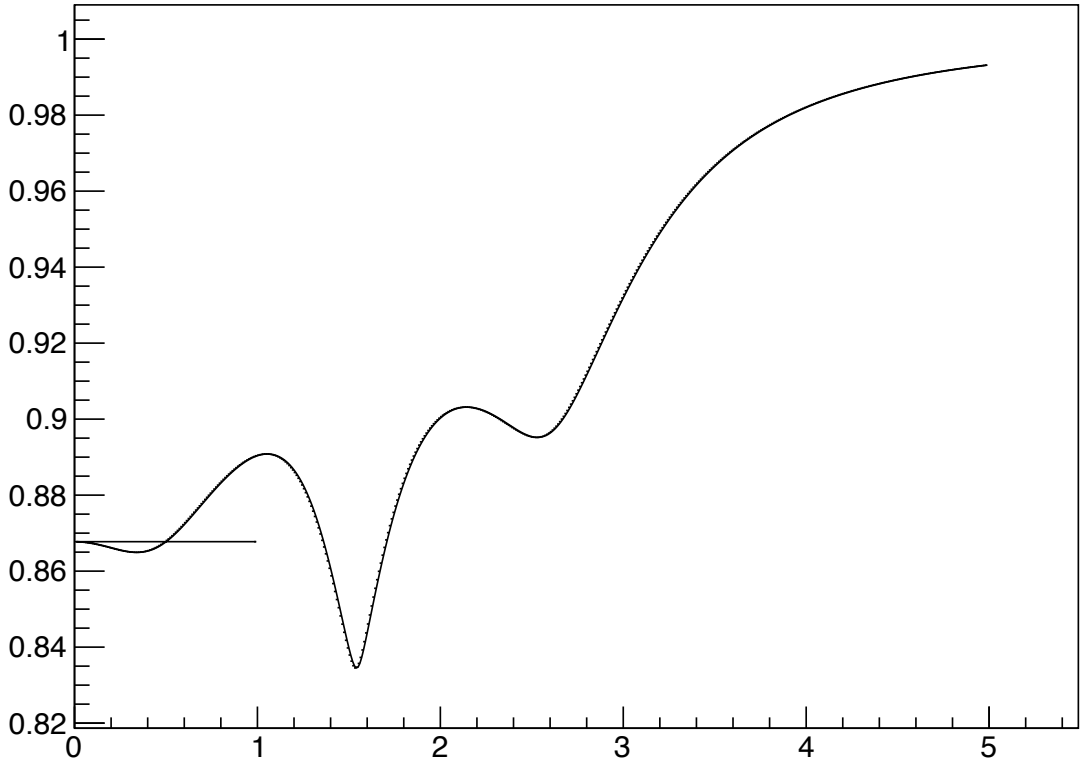
Leading Jet |Y|



Minimum of global Correlation (Data Parton)

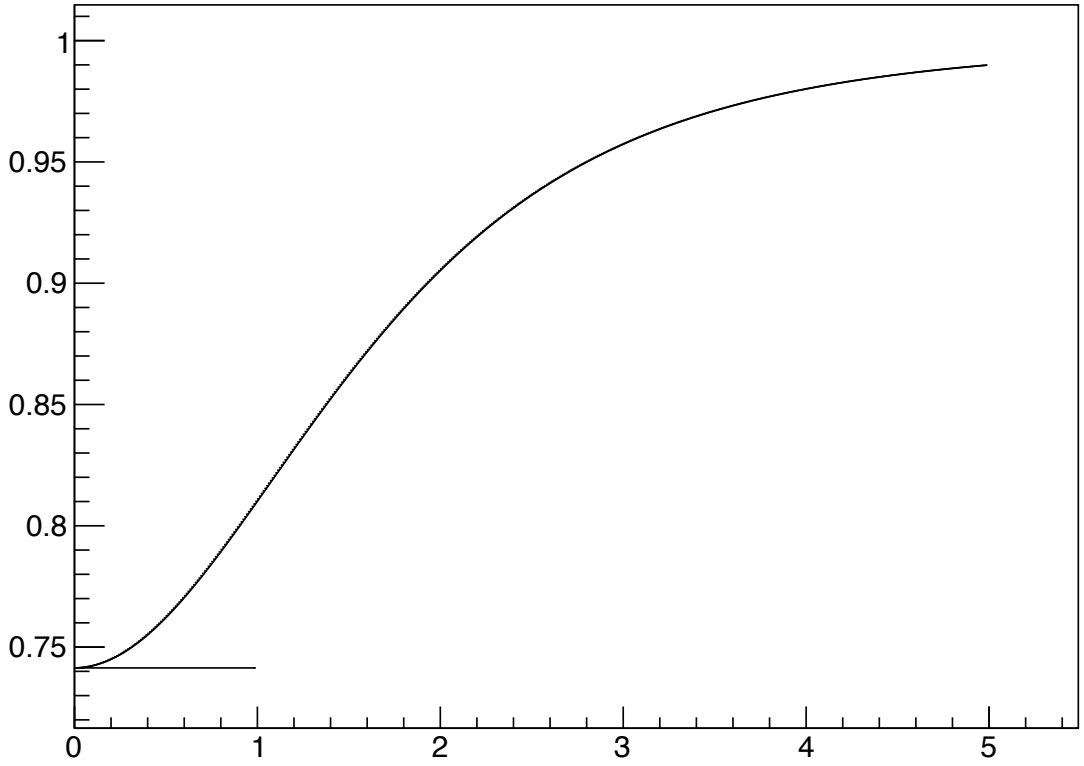
Leading Jet Pt

Graph



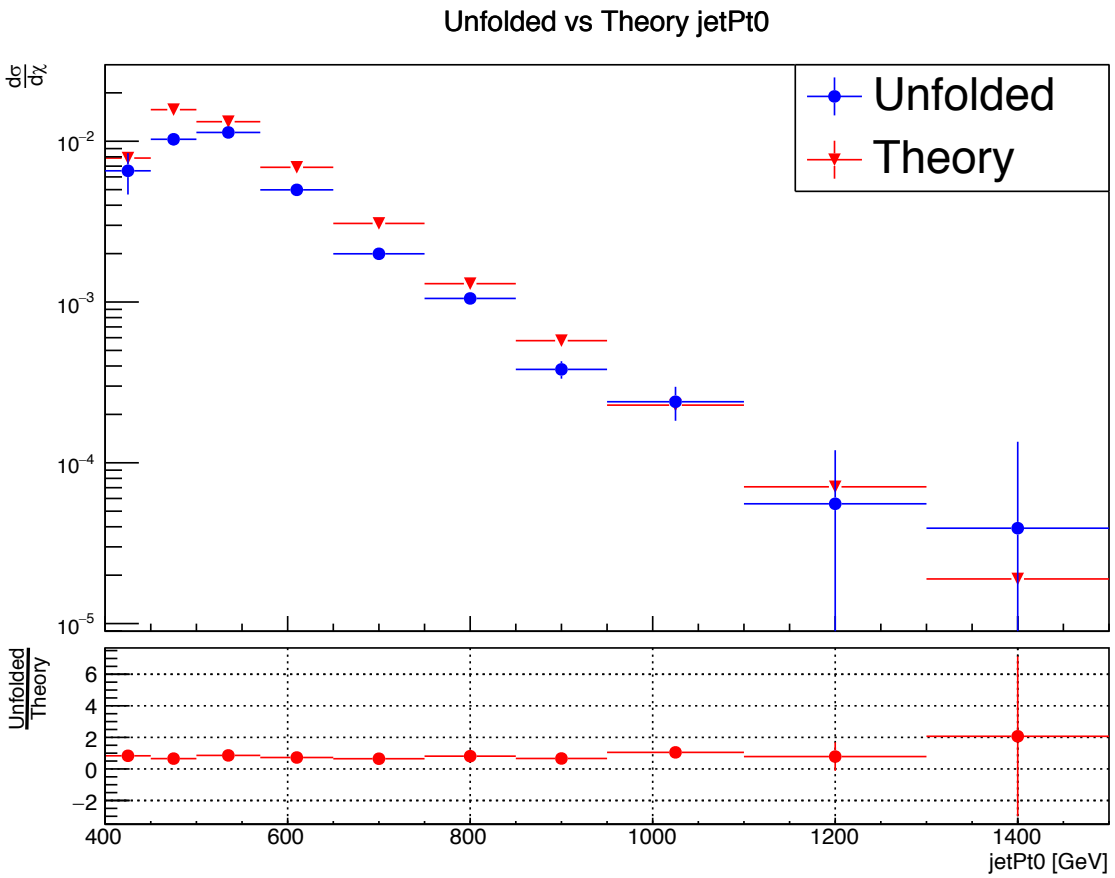
Leading Jet |Y|

Graph

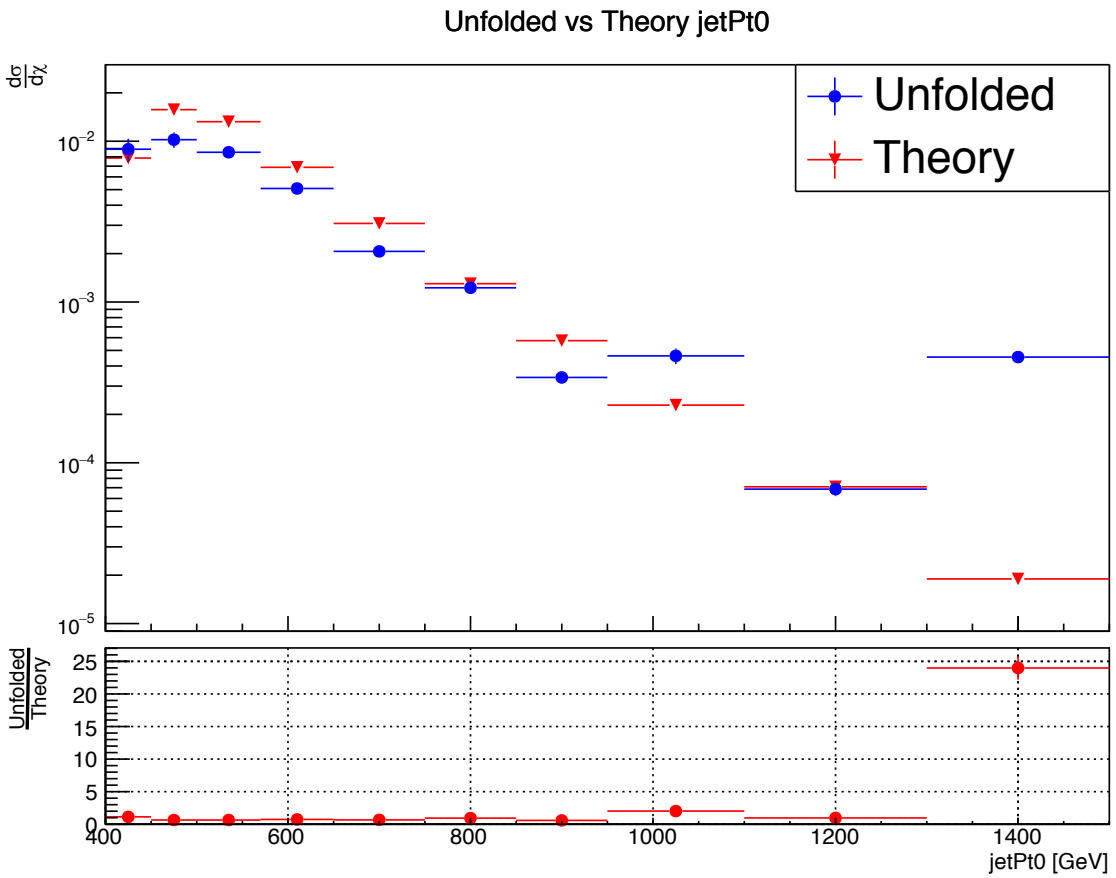


Parton level

Simple matrix inversion

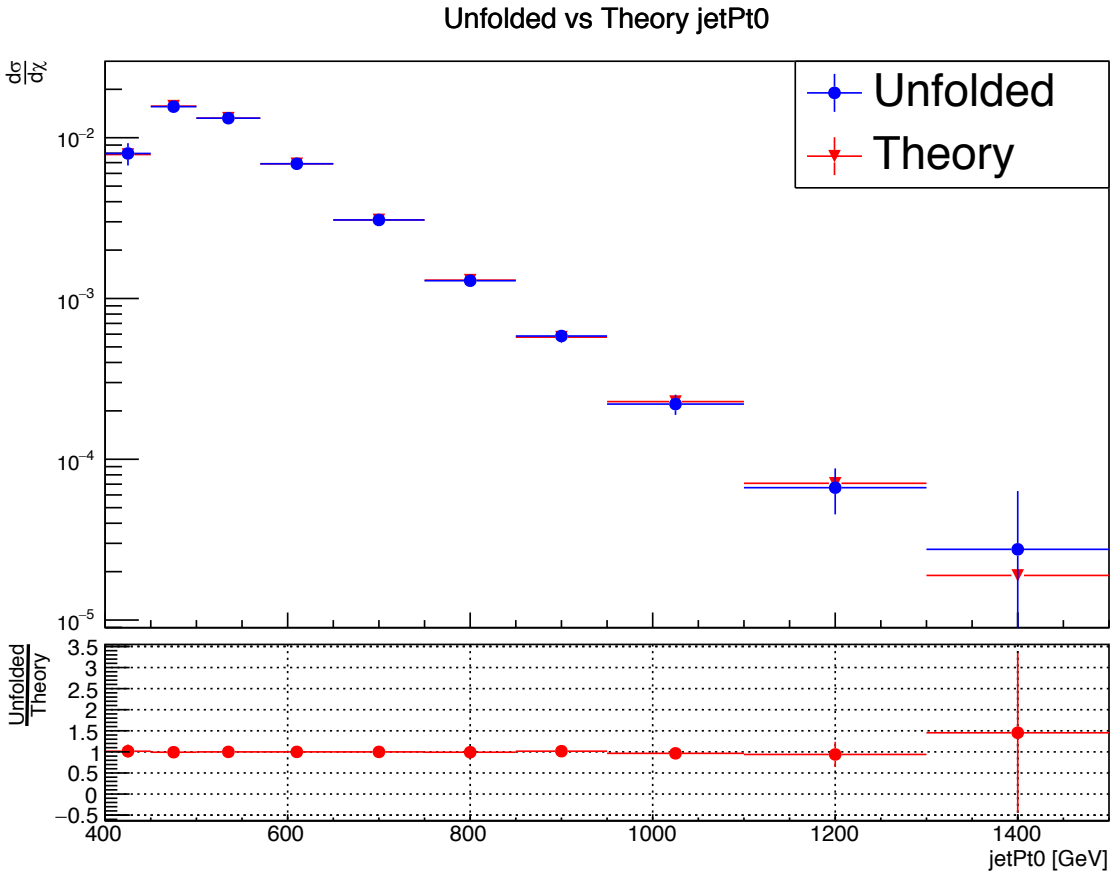


Minimum of Global Correlation

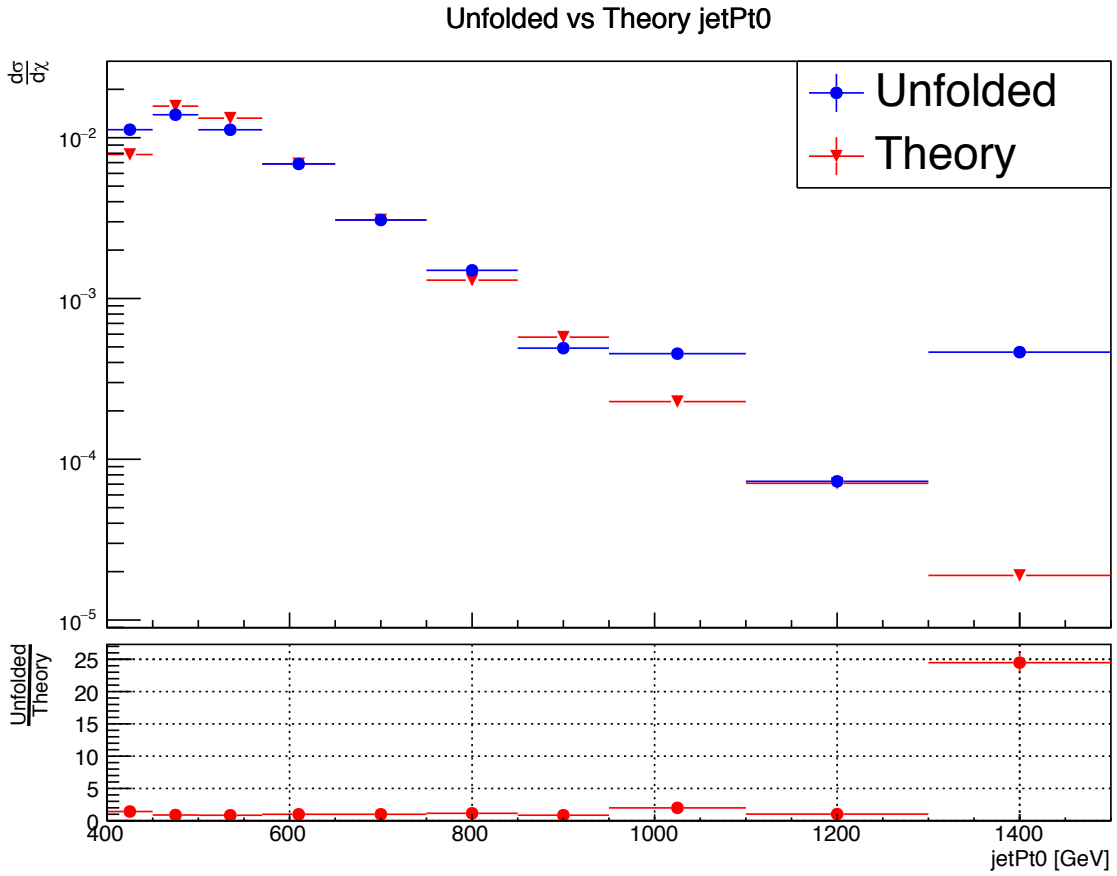


Parton level MC

Simple matrix inversion

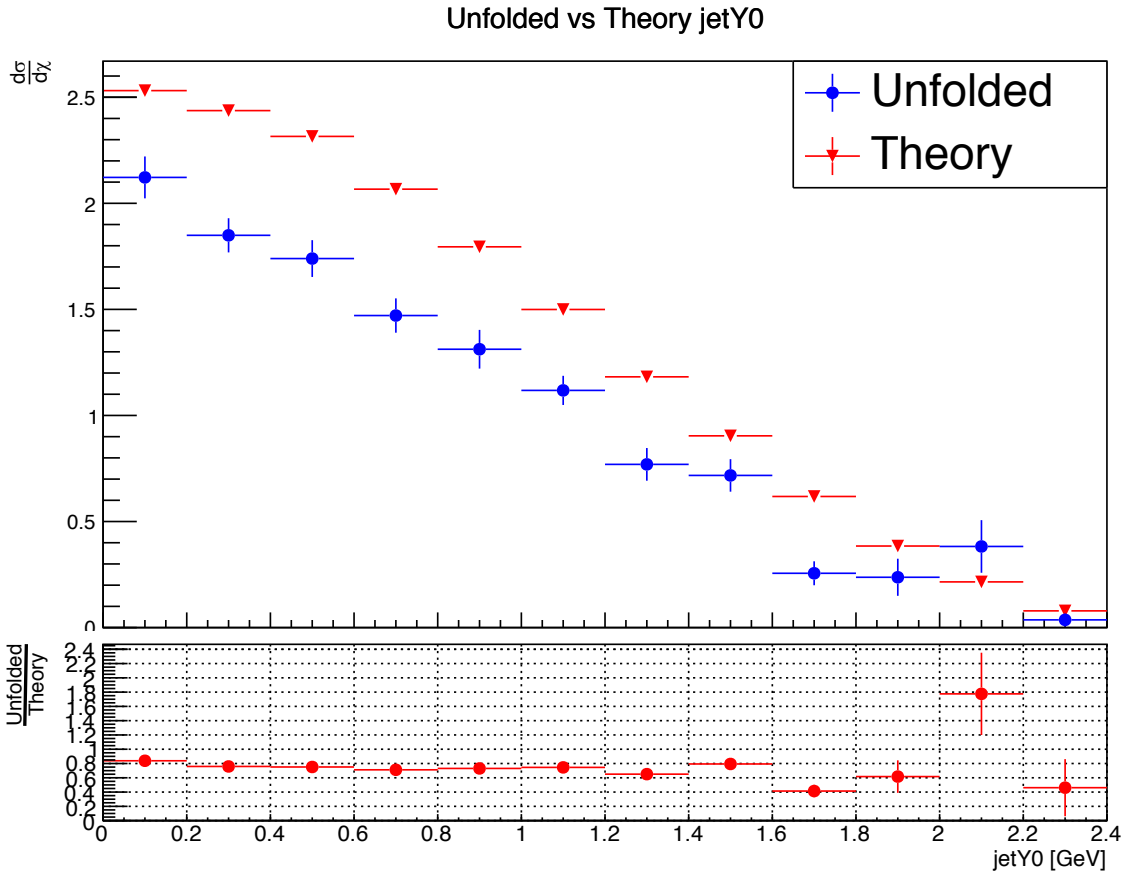


Minimum of Global Correlation

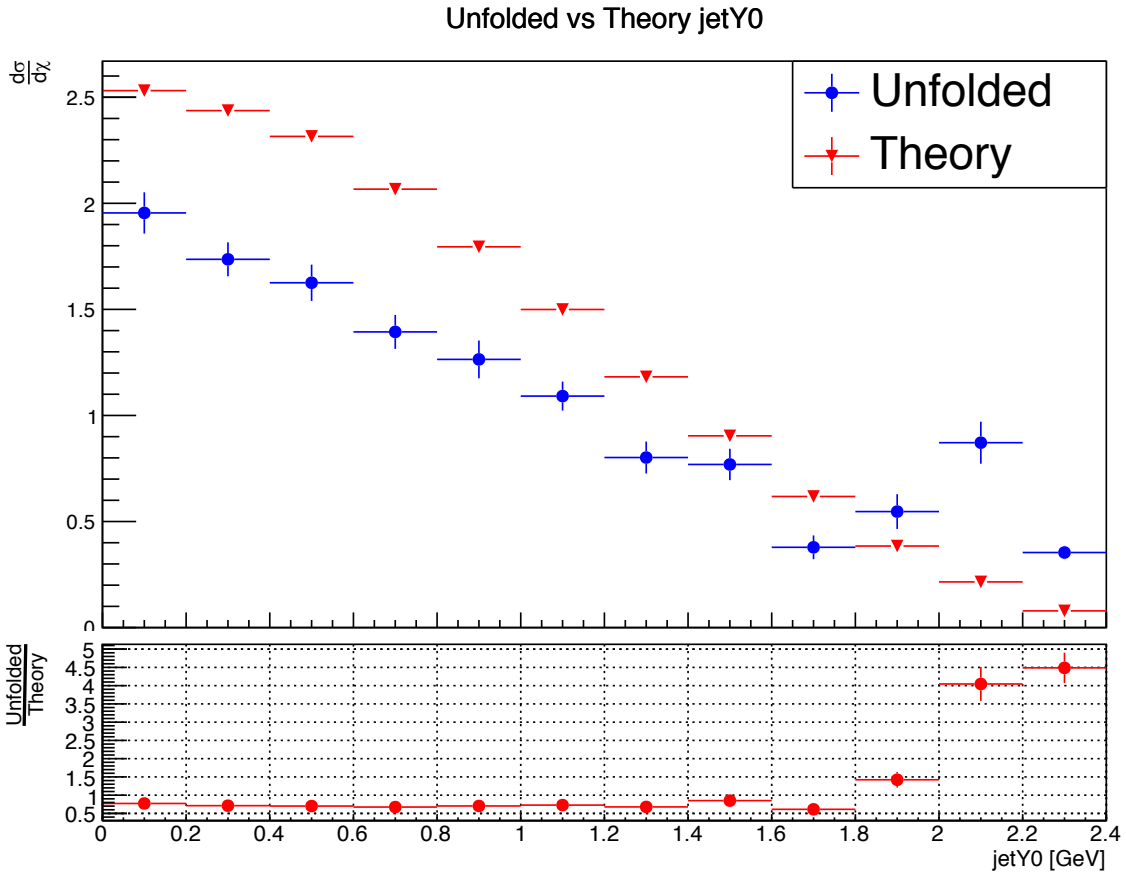


Parton level

Simple matrix inversion

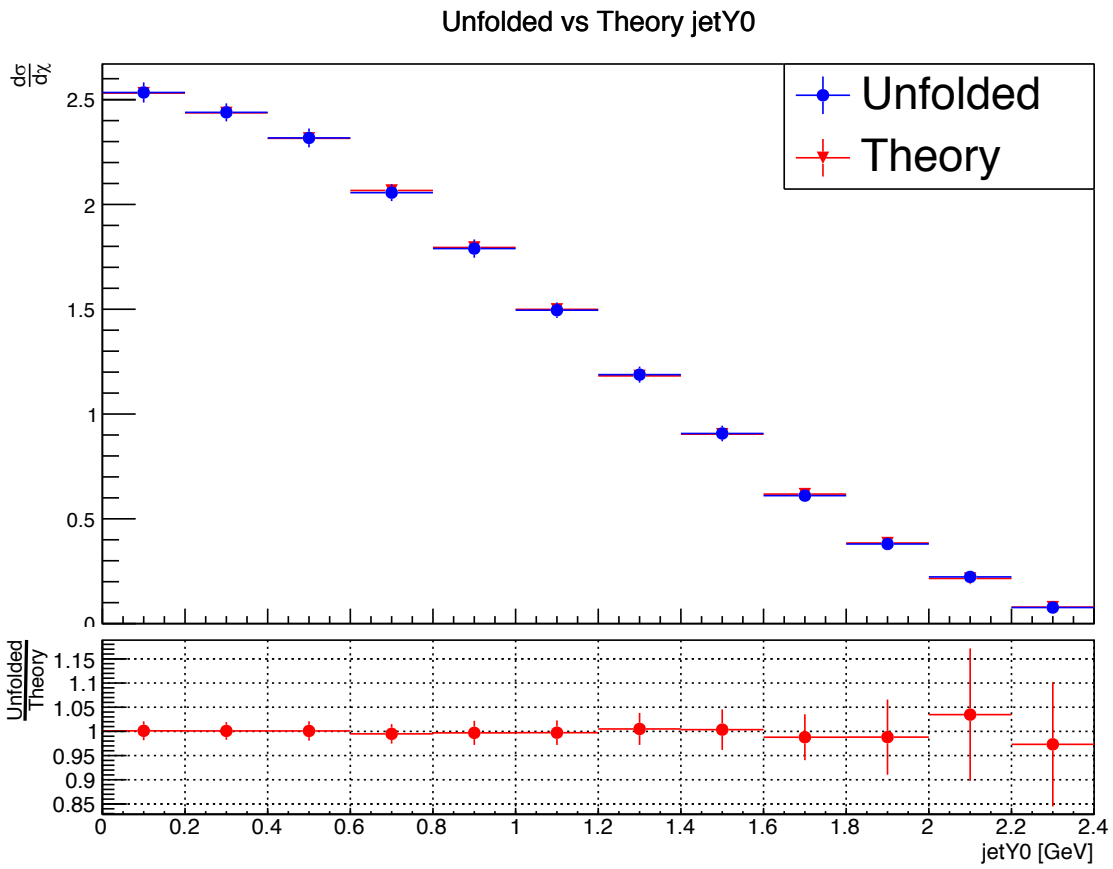


Minimum of Global Correlation



Parton level MC

Simple matrix inversion



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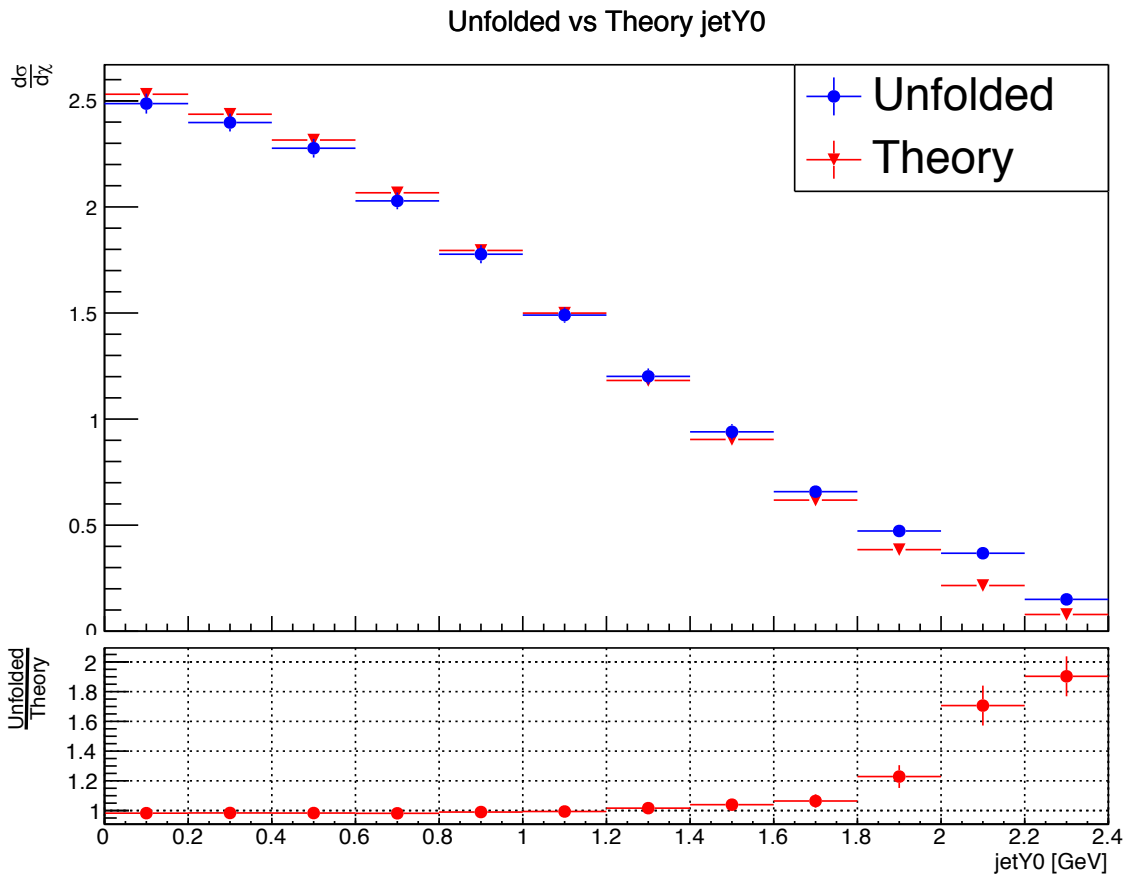
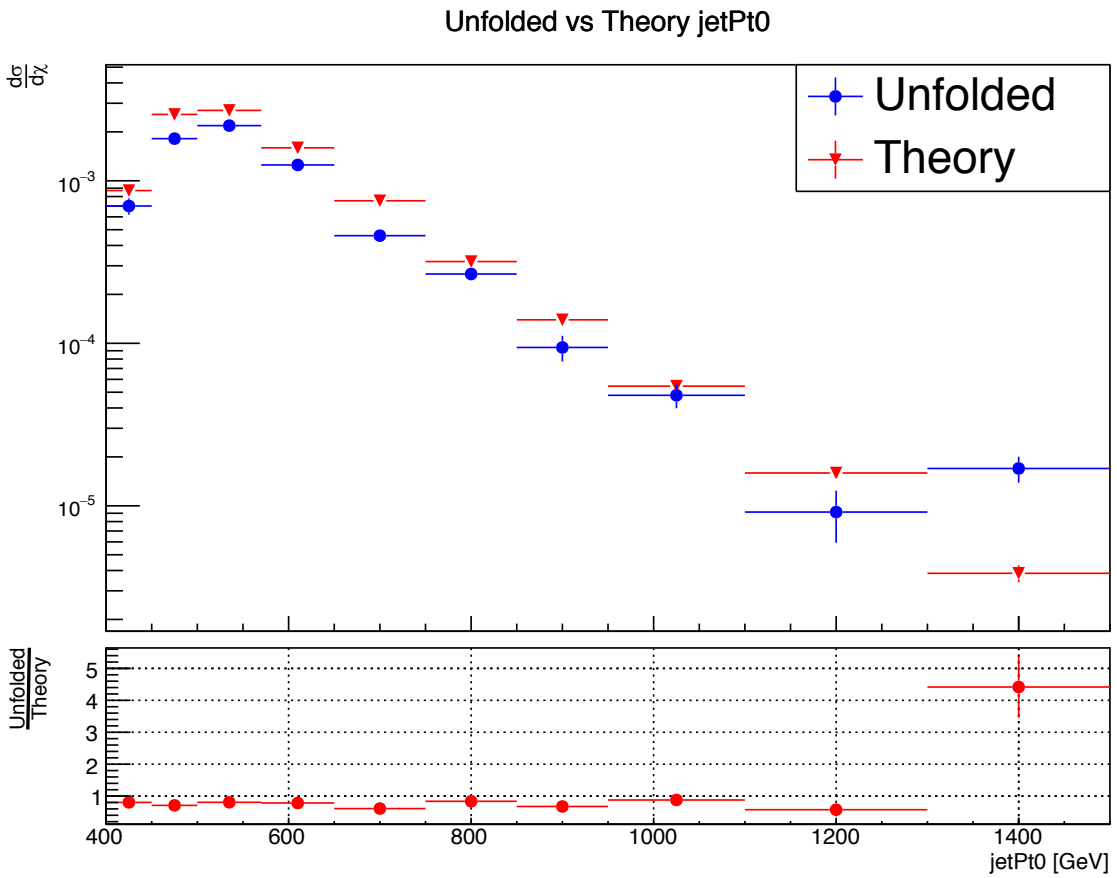
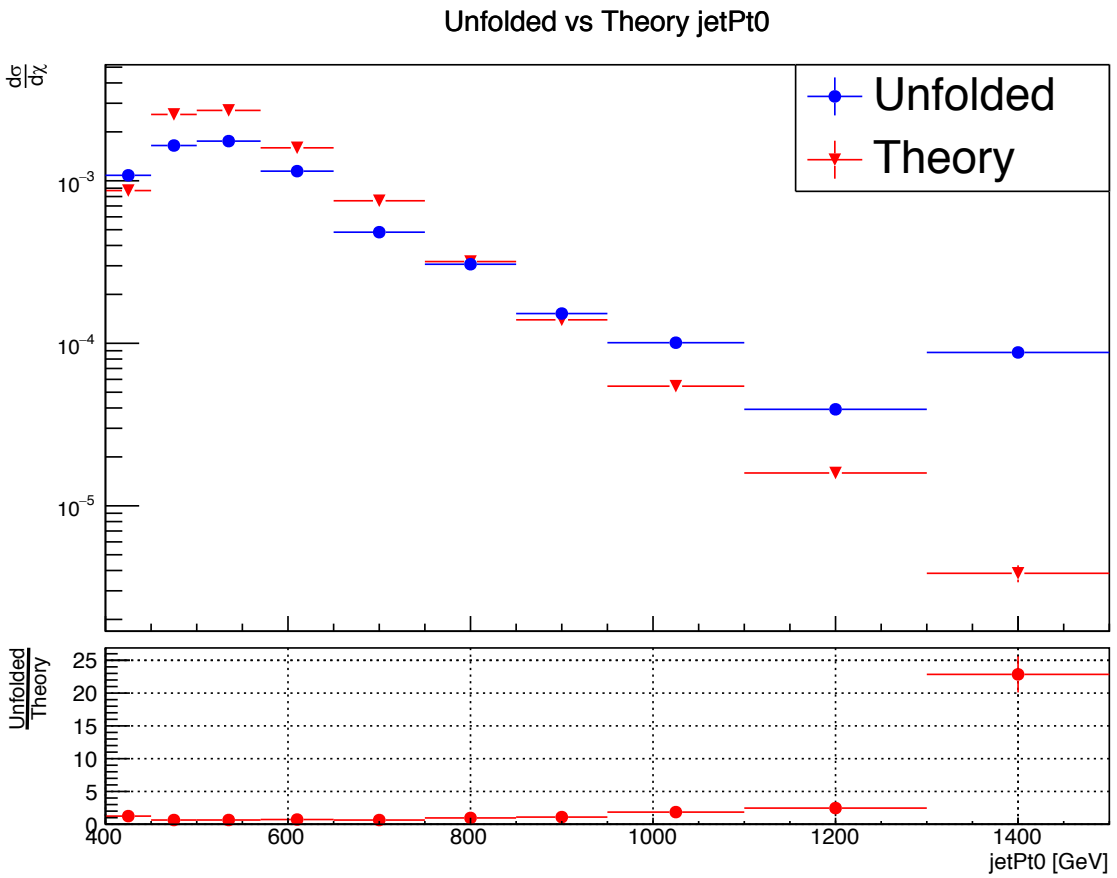


Particle level

Simple matrix inversion

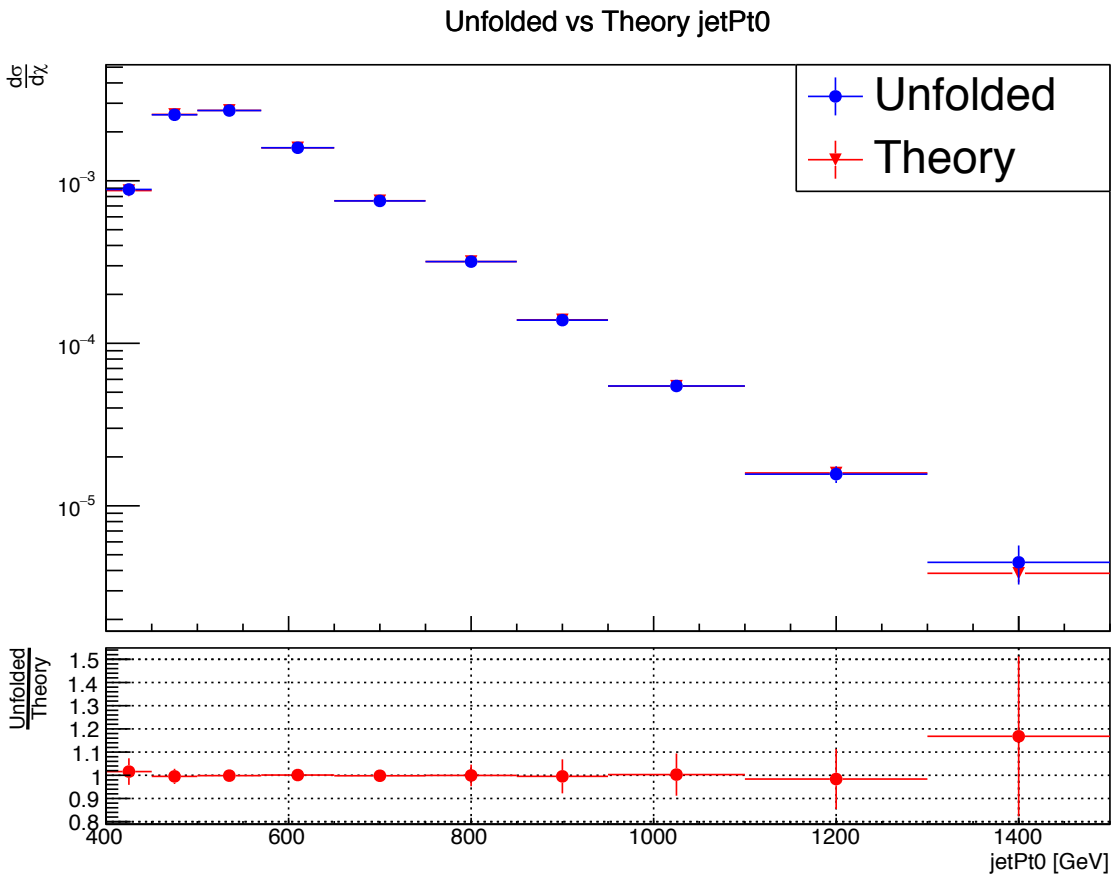


Minimum of Global Correlation



Particle level MC

Simple matrix inversion



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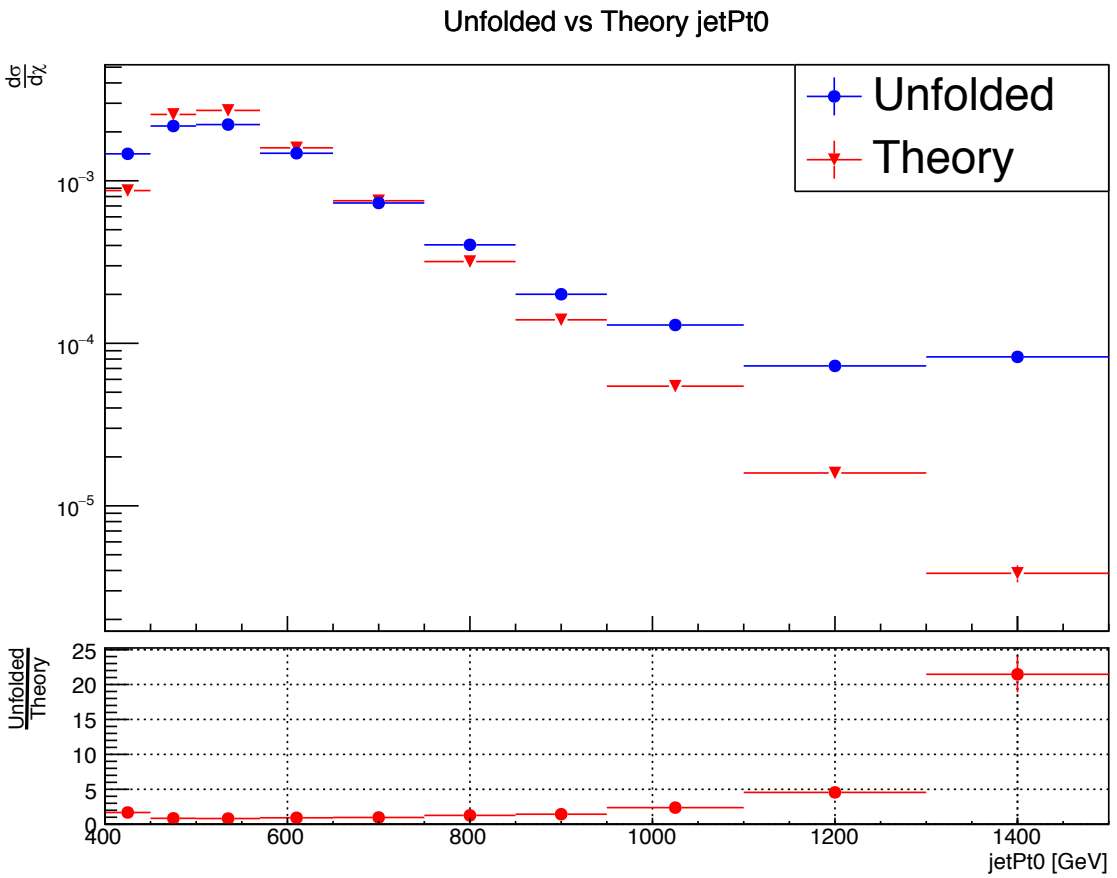
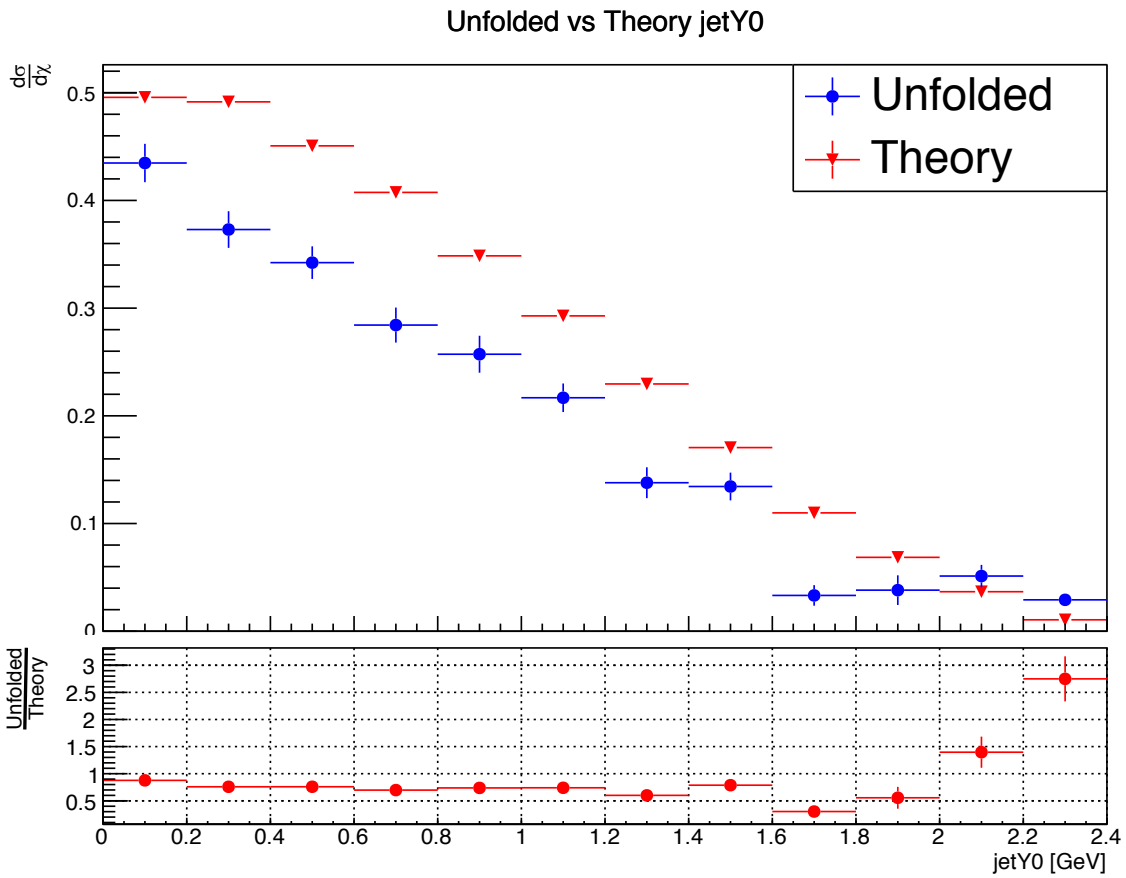


Particle level

Simple matrix inversion



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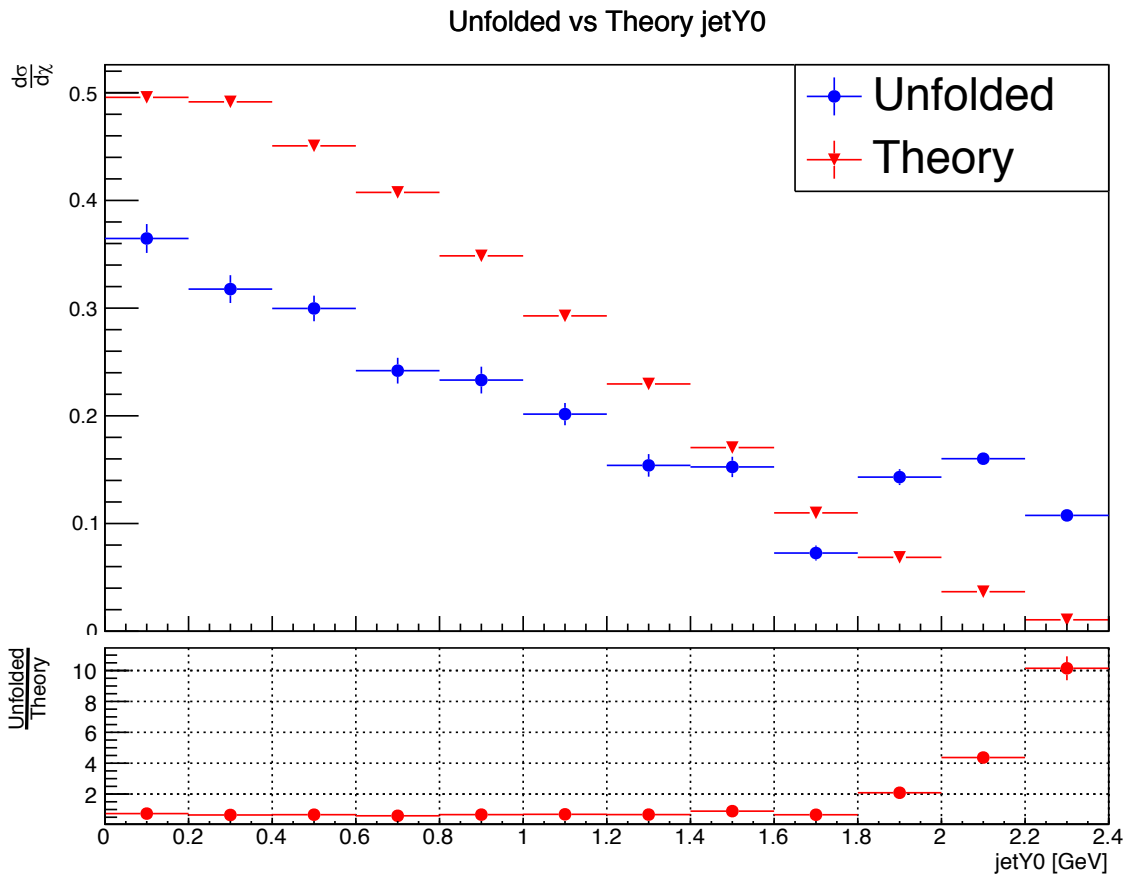
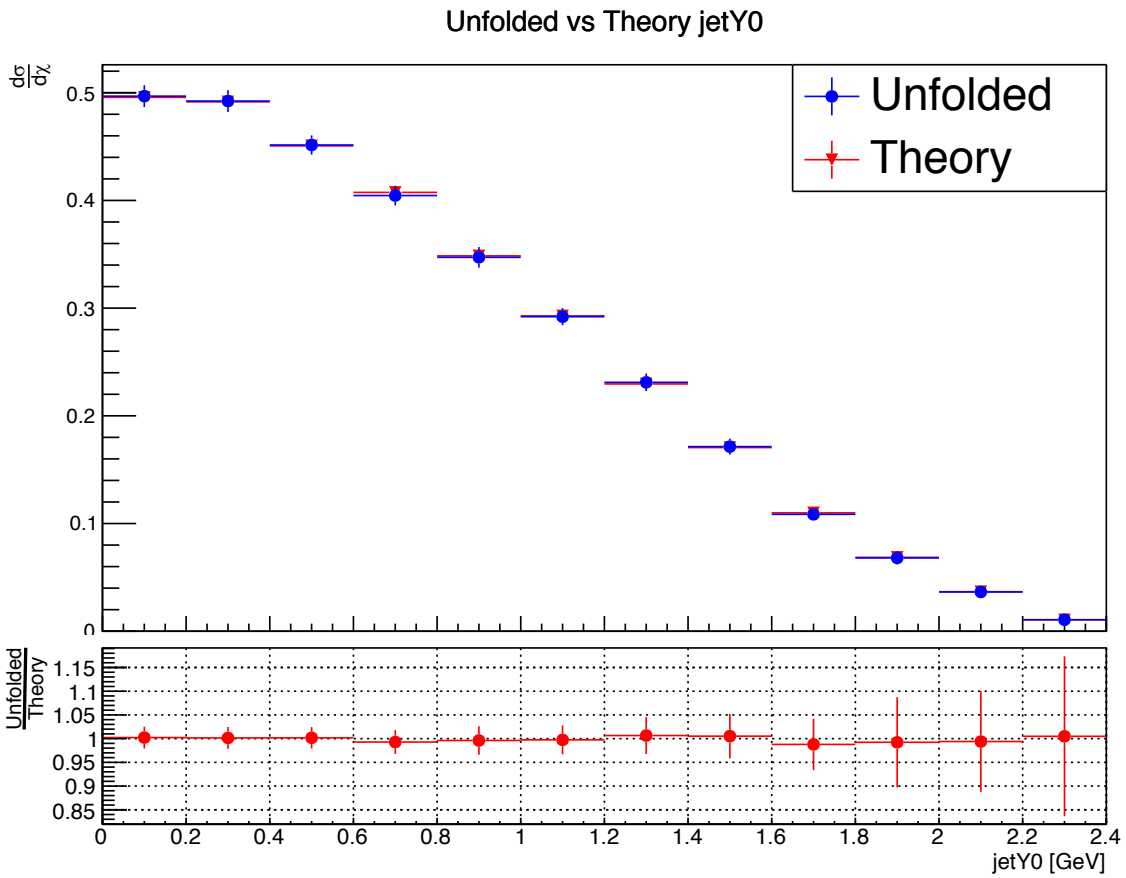


Particle level MC

Simple matrix inversion



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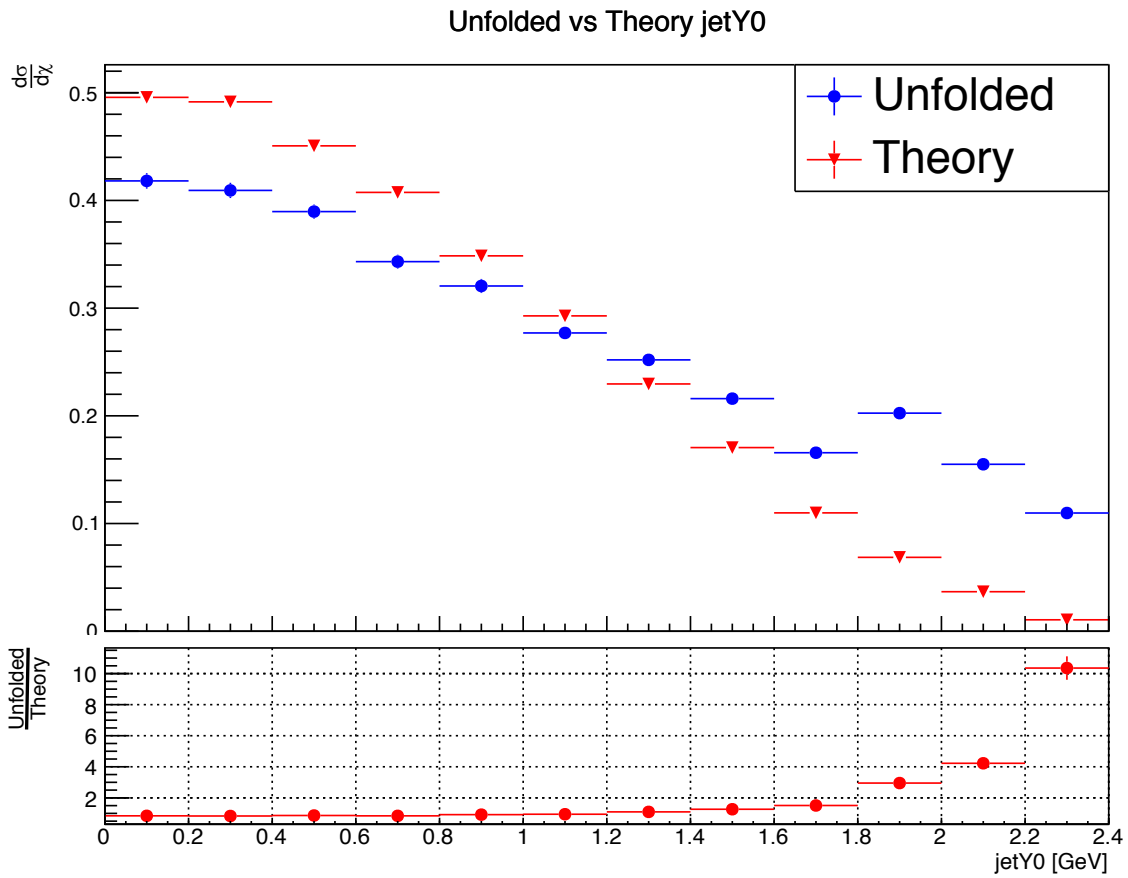
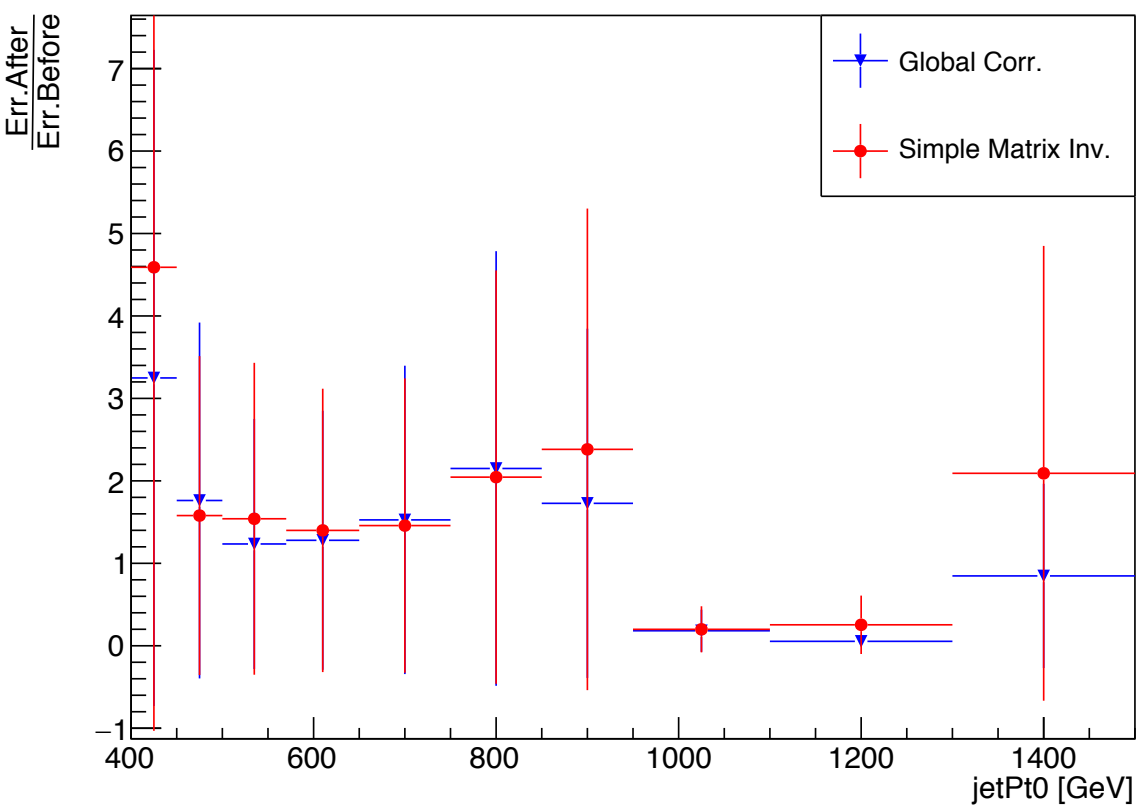
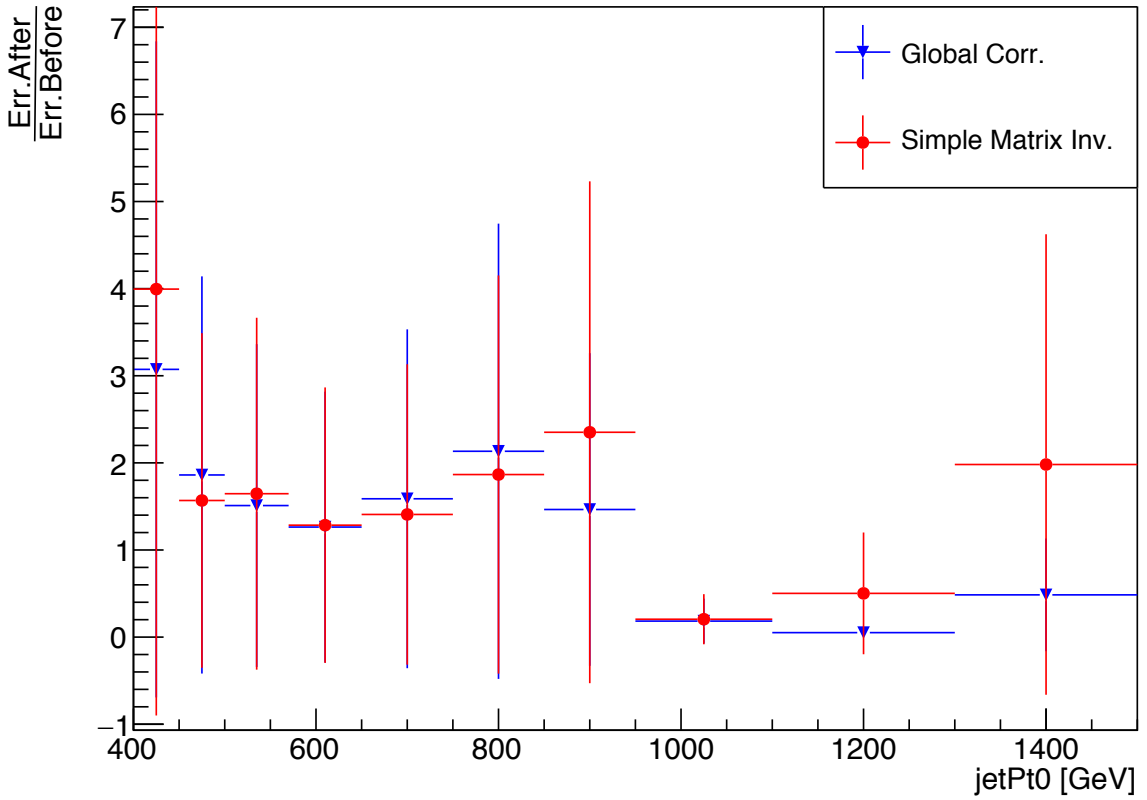


Error Propagation Data

MC



Data



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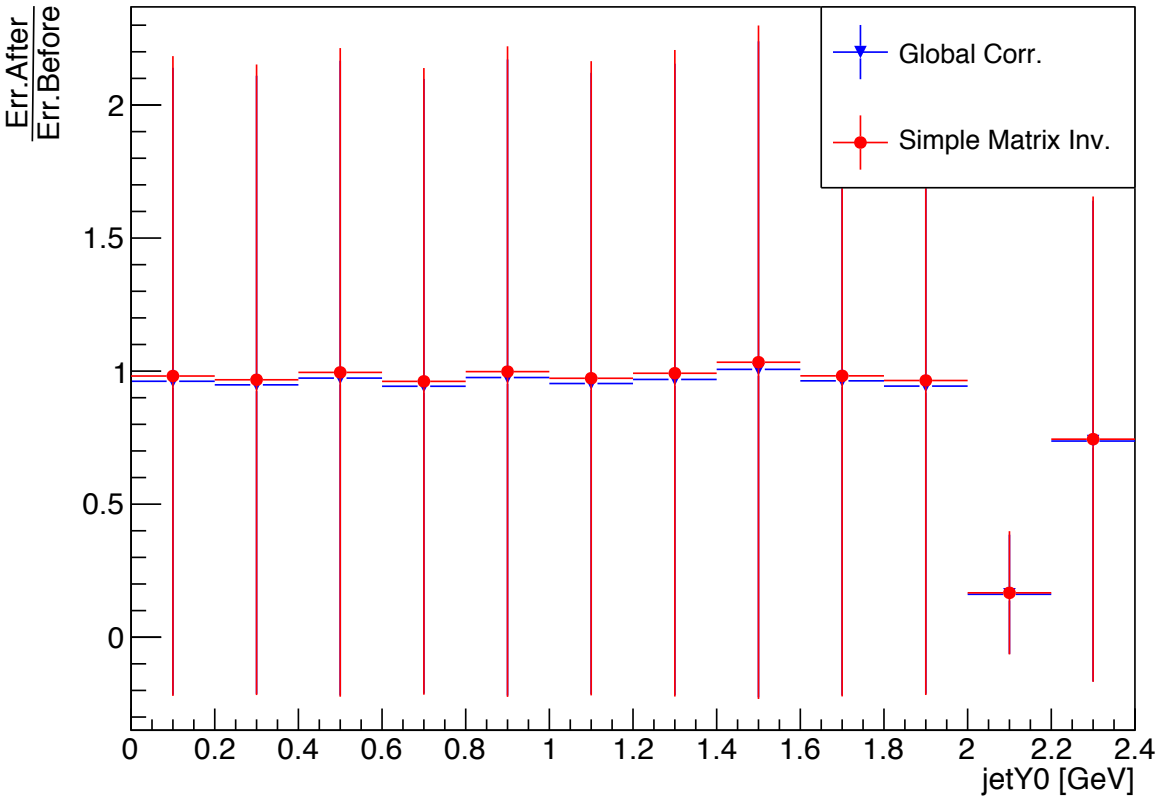
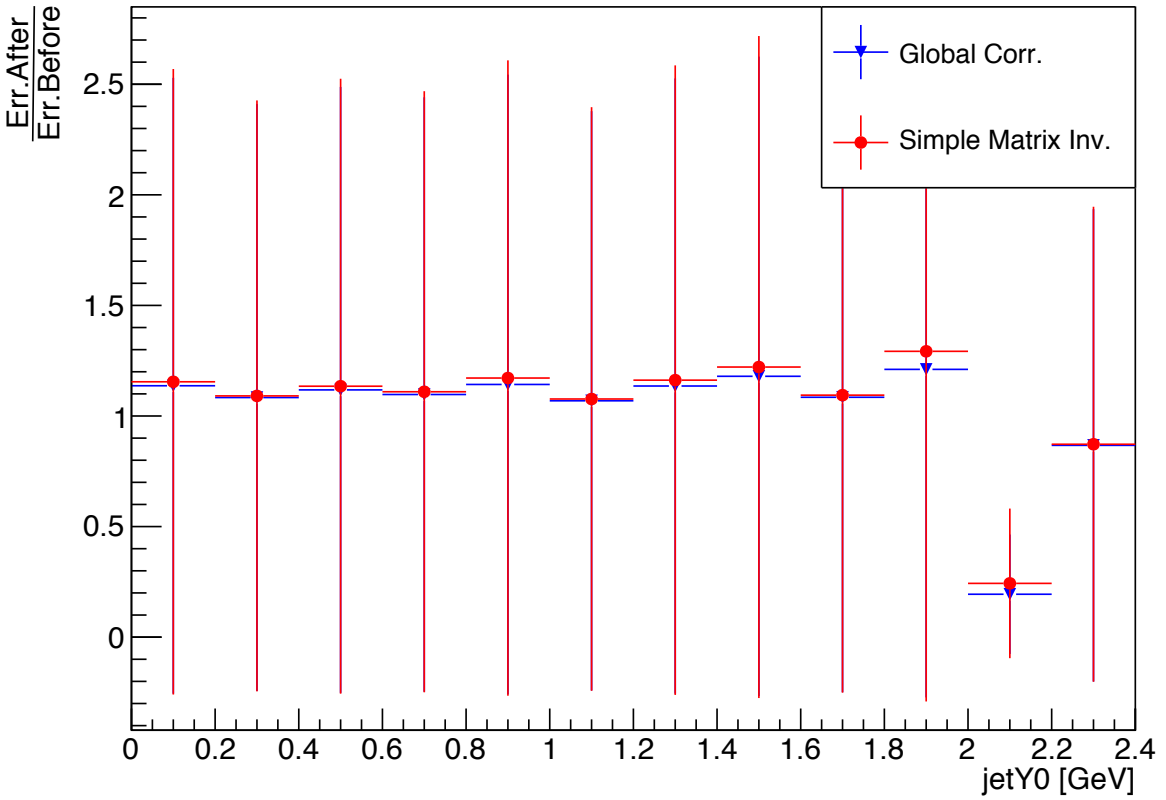


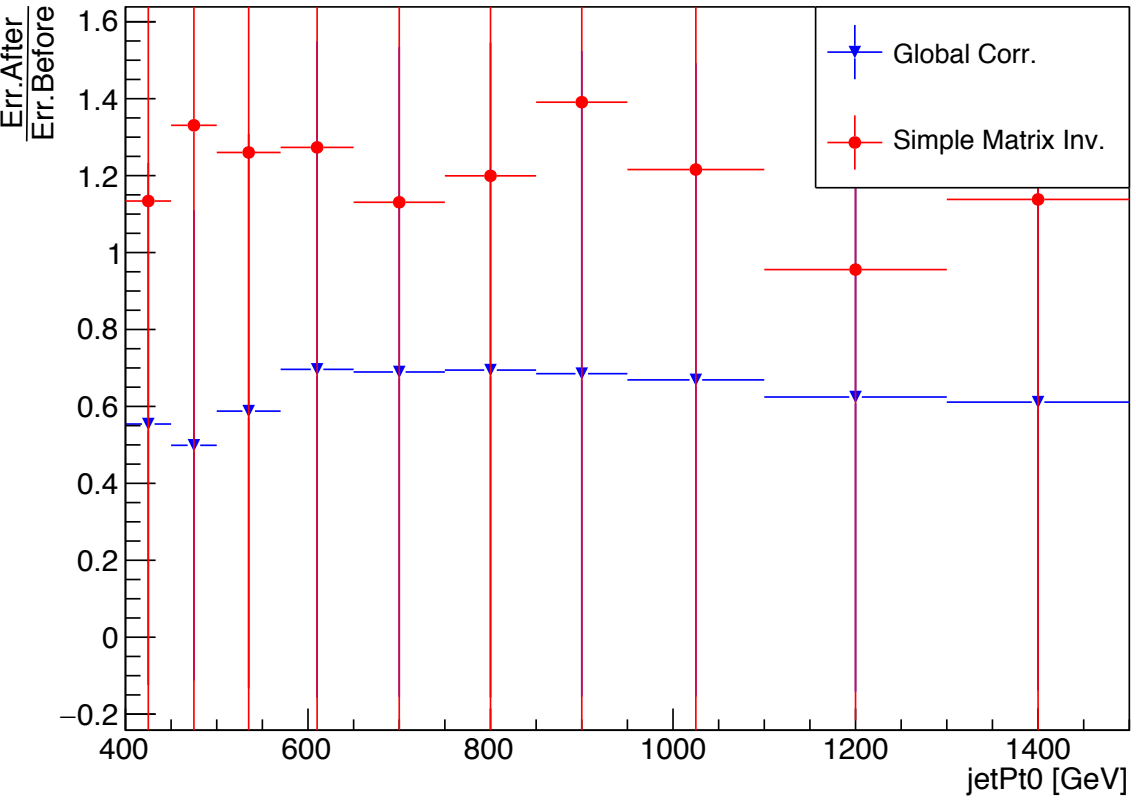
Data



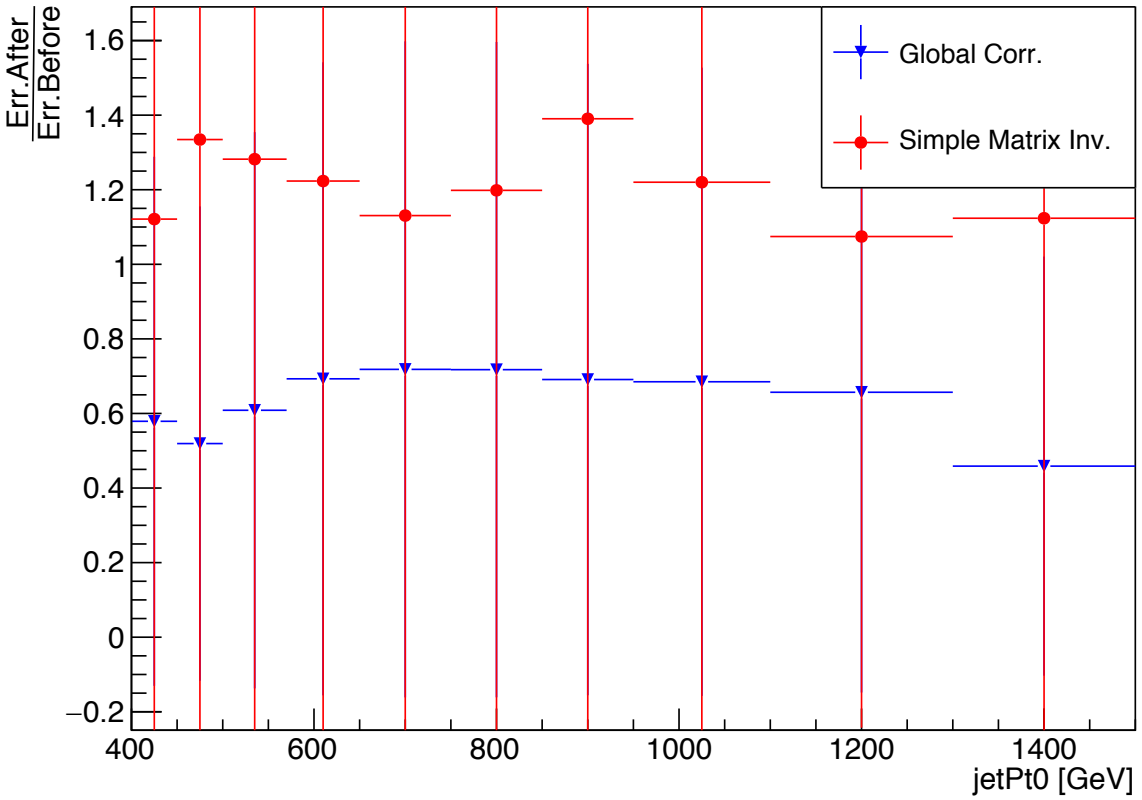
BACKUP

Error Propagation Data

MC



Data



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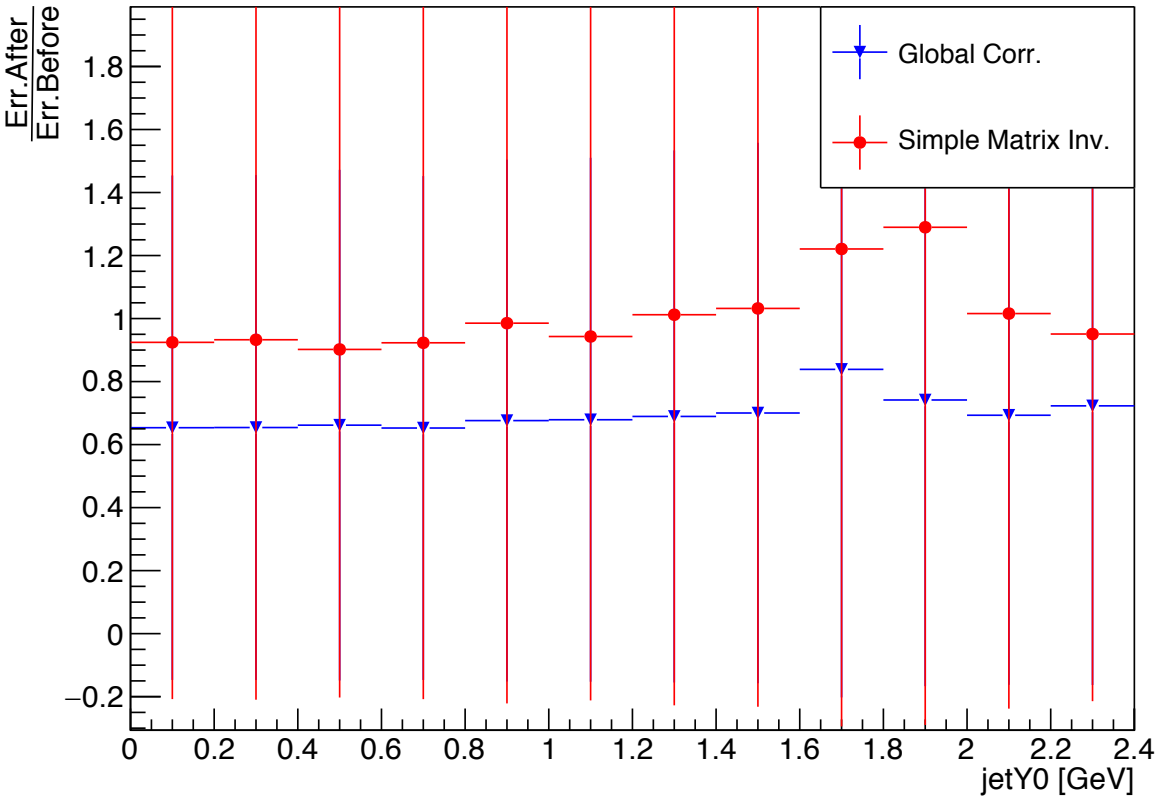
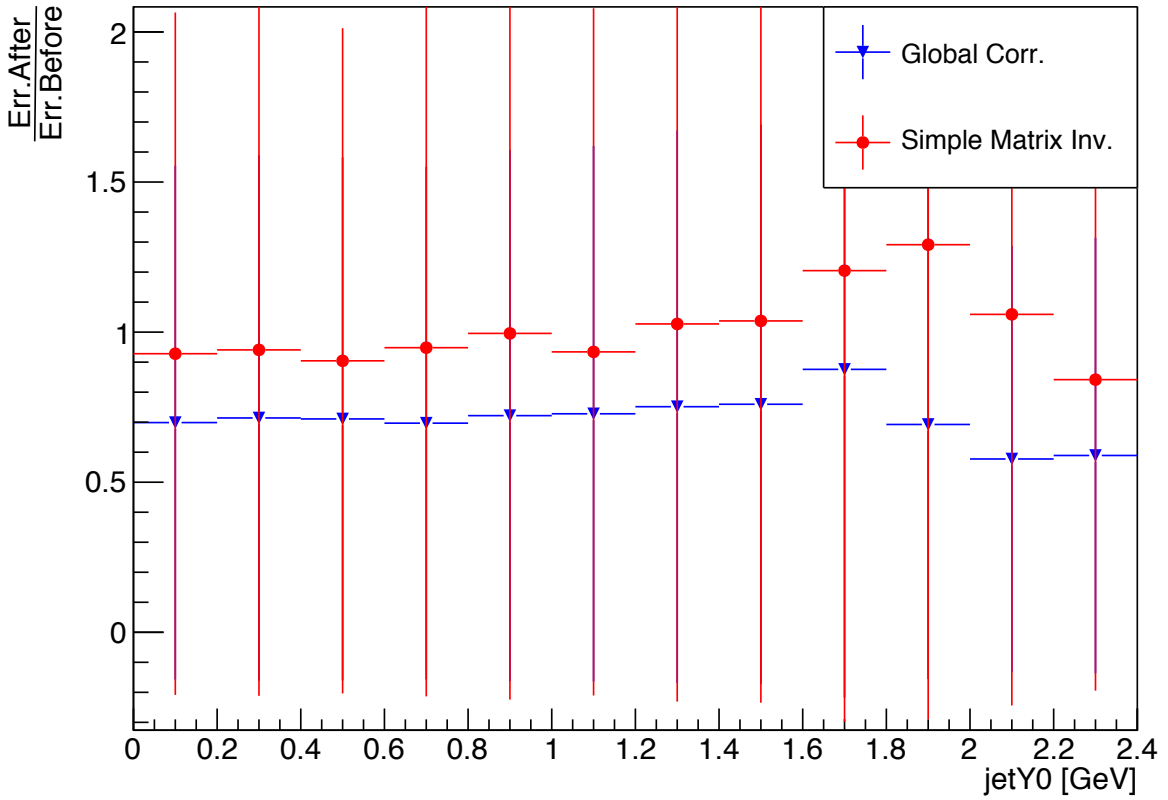
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