

$W \rightarrow ev + \geq 2 \text{ Jets}$

TALK OUTLINE

- Data/Montecarlo Samples Used and theory description.
- Tight-Electron/Jet/MET/W Selection Cuts
- Tight /QCD Electron ID Cuts
- Tight /QCD Eletron ID Variables Plots
- MET/W Transverse Mass Plots
- Jet Selection Cuts – Comments
- Jet Variables Plots
- $\Delta\phi/\Delta R$ – Electron-JET Plots
- Electron SVX ONLY Track Qualitiy Plots
- Jet Track Selection and Jet Vertexing Algorithm
- Jet Tracks Quality Plots BEFORE Eliminating ΔZ wrt Jet Z >0.04cm)
- Jet Tracks Quality Plots AFTER Eliminating ΔZ wrt Jet Z >0.04cm)
- **SCATTER $\Delta Z/\Delta\phi$ with W+ONLY-TWOJETS**
 - $\Delta\phi(\text{Electron}, \text{MET}) > 2.5 / \Delta Z(\text{Electron}, \text{Leading}) < 0.04 \text{ AND } \Delta Z(\text{Electron}, \text{Second}) < 0.04 \text{ AND } \Delta Z(\text{Second}, \text{Leading}) < 0.04 \text{ cm}$
 - $\Delta\phi(\text{Electron}, \text{MET}) > 2.5 / \Delta Z(\text{Electron}, \text{Leading}) > 0.04 \text{ AND } \Delta Z(\text{Electron}, \text{Second}) > 0.04 \text{ AND } \Delta Z(\text{Second}, \text{Leading}) < 0.04 \text{ cm}$
 -



Data/MC Samples Used

- Data/MC Samples Used
 - Data Samples
 - MC sample With MPI
 - MC Sample Without MPI
- Event Selections Cuts
 - General Event Selection
 - Tight-Electron Selection
 - MET/W Selection
 - Jet selection
 - Electron-Jet-MET $\Delta R/\Delta\phi$

Event Selection Cuts



- Tight electron cuts applied to select the Electron from the Ntuple
- Electron-Jet object removed from the Jets in the Ntuple
- Jets with L5 JES corrected $ET > 7 \text{ GeV}$ and $|ETA| < 2$ selected
- $\Delta R(\text{Electron}, \text{Closest-Jet}) > 0.92 (1.3 * \text{radius of cone})$
- $\Delta\phi(\text{MET}, \text{All-Jets}) > 0.7$, $\Delta\phi(\text{Electron}, \text{MET}) > 0.7$
- Missing ET corrected for Muons/Jets-Selected
- ONLY ONE Tight-Electron, $\text{MET} > 30 \text{ GeV}$, Transverse Mass $> 50 \text{ GeV}$
- ONLY TWO Jets (as selected above)
- Above Leading/.Second Jet need to have at least TWO TRACKS in them

Electron cuts/variables

- Electron Selection Cuts
 - Tight Electron
 - QCD Electron
- Electron Variables Distribution
 - Compare Tight/QCD Electron Variables on the same plot

Tight Electron Selection Cuts



SELECTION CUTS	
ET/ ETA	$\geq 20 \text{ GEV}/<1.0$
TRACK PT	$\geq 10 \text{ GEV}/C$
HADEM	$\leq 0.055 + (0.0045 * E)$
LSHR	≤ 0.2
EOVERP	≤ 2
TRACK Z0	$\leq 60 \text{ CM}$
TRACK QUALITY CUTS	
TRACK CHI2	≥ 10
CALORIMETRIC ISOLATION	≤ 0.1

QCD Electron Selection Cuts

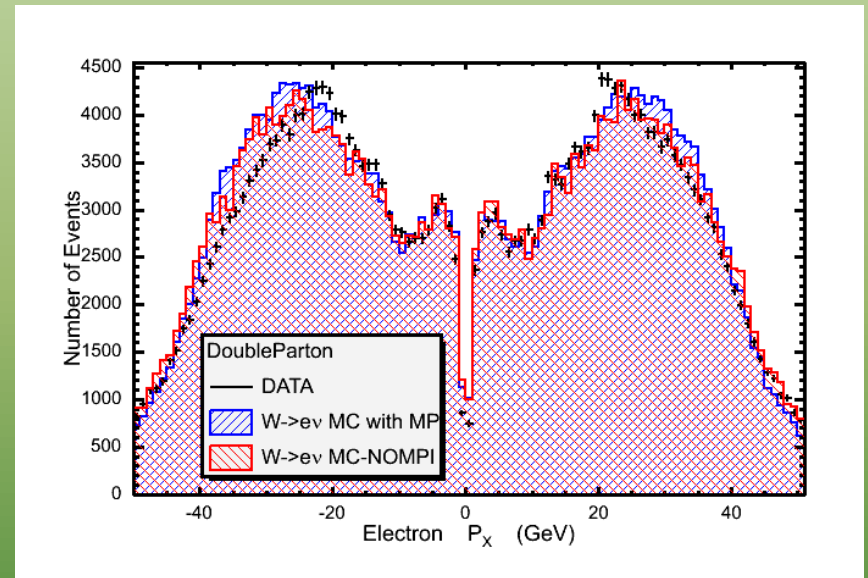
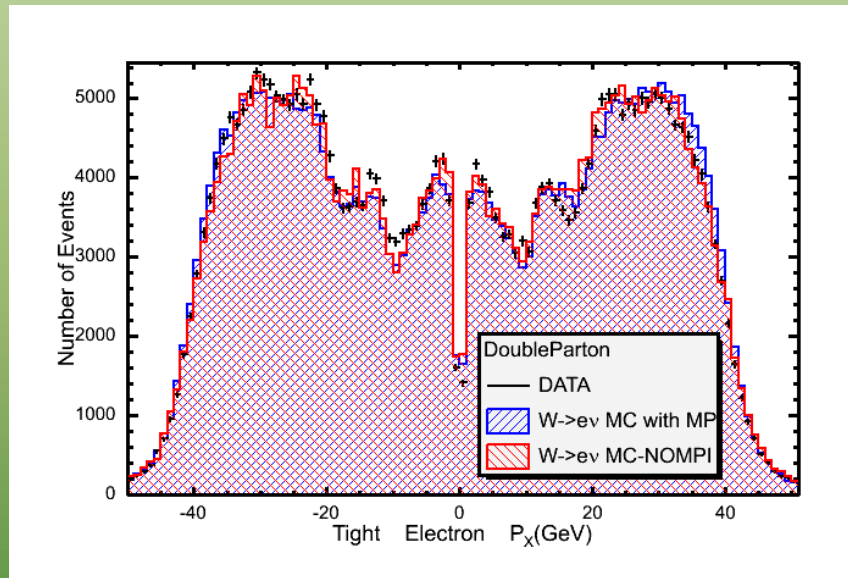
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Electron ID Variables



$\Delta\phi(\text{Electron}, \text{MET}) > 2.5$

$\Delta\phi(\text{Electron}, \text{MET}) < 2.5$



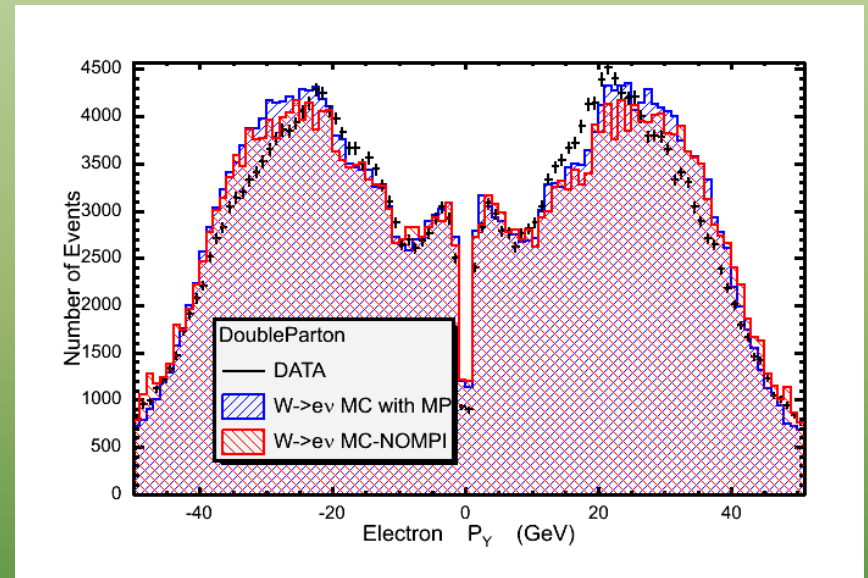
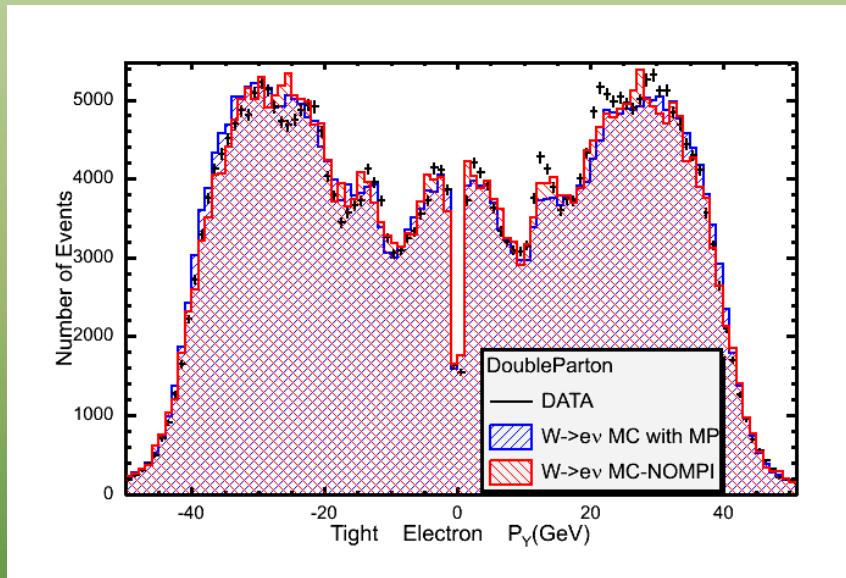
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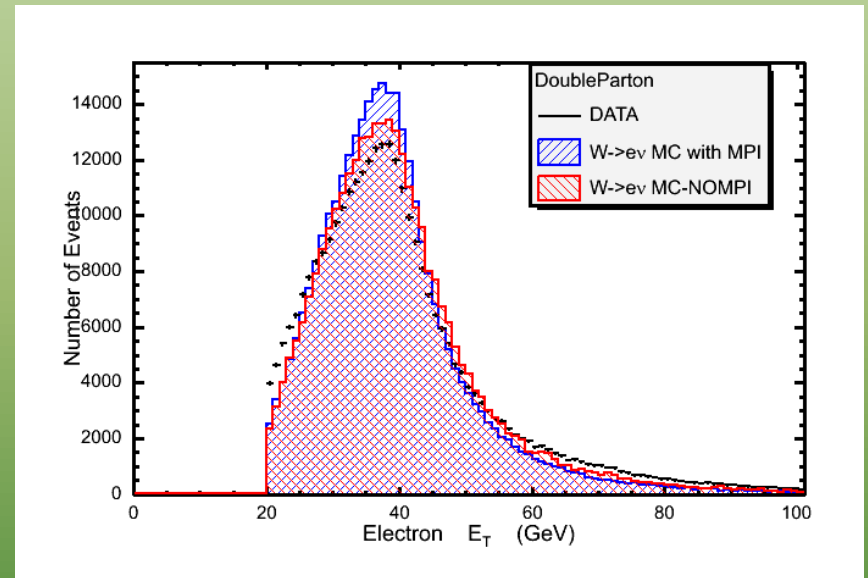
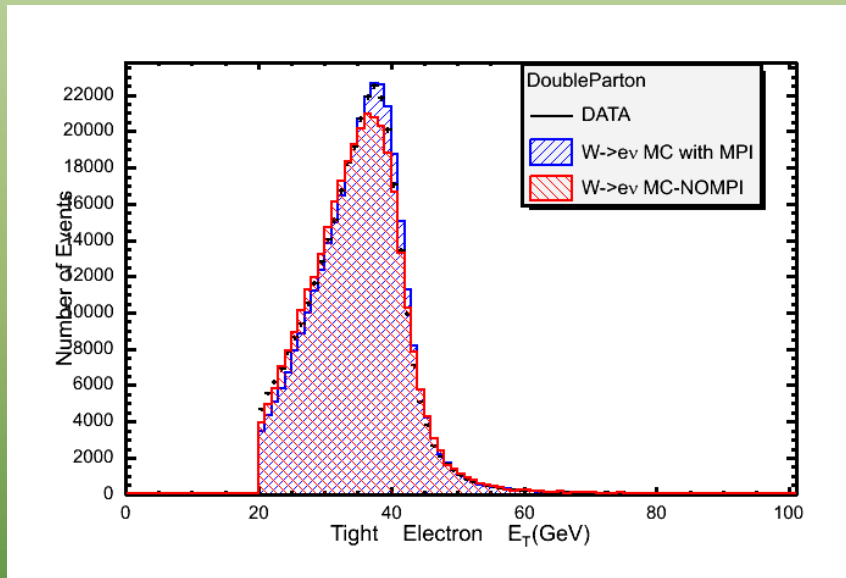
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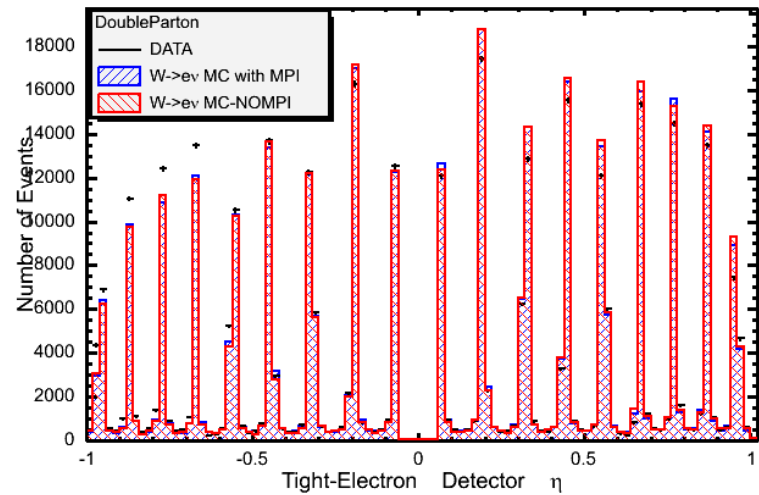
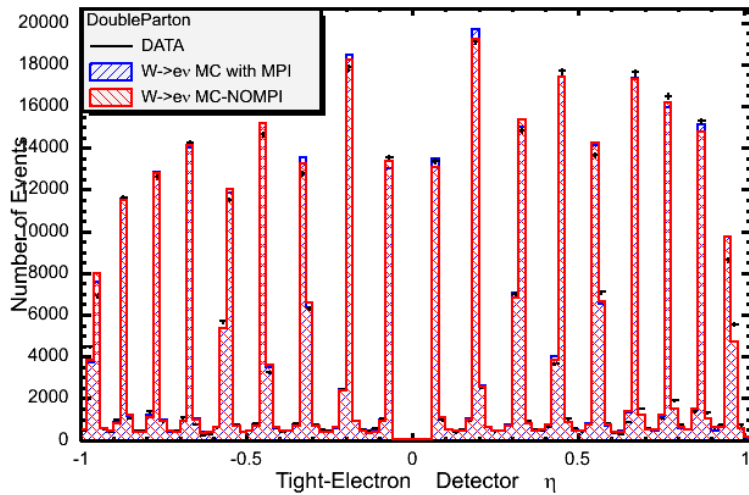
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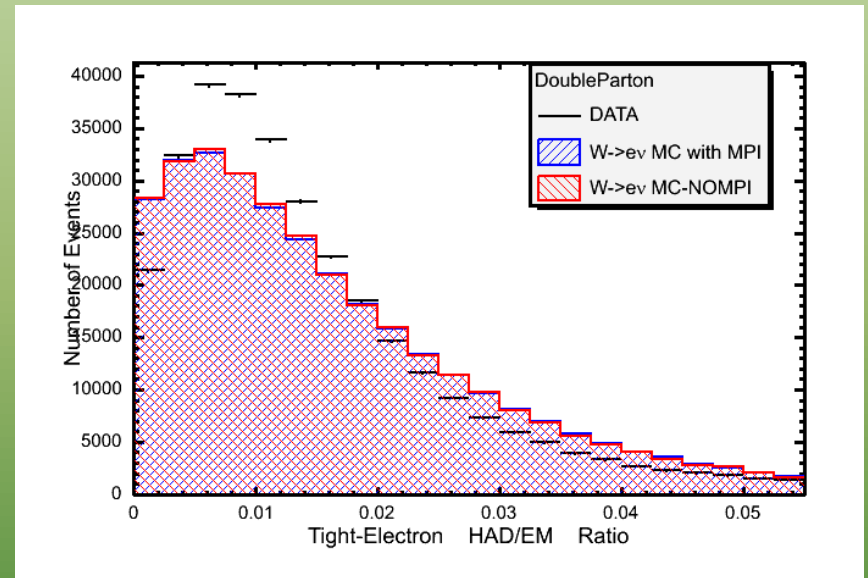
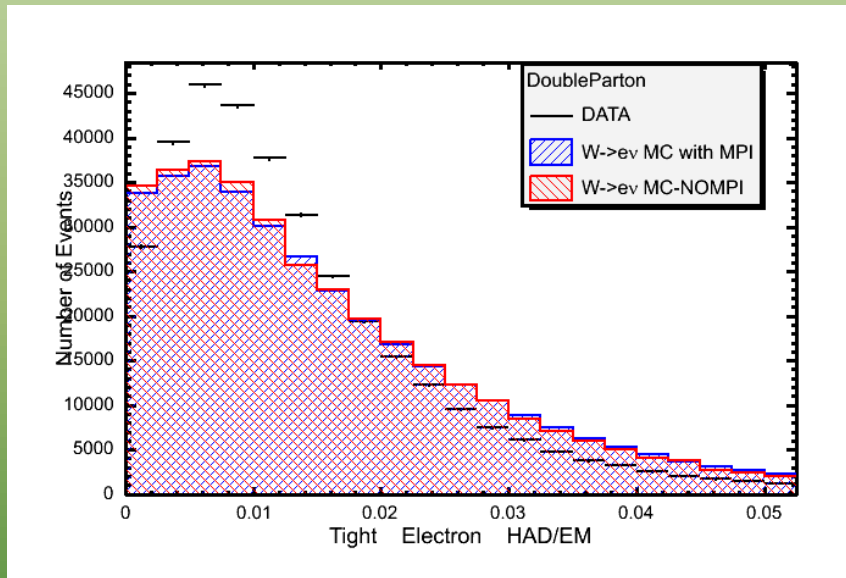
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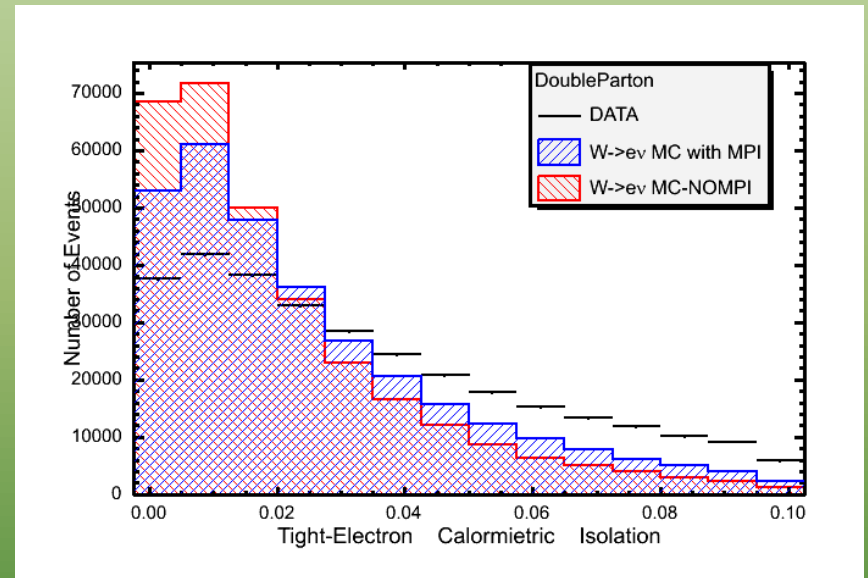
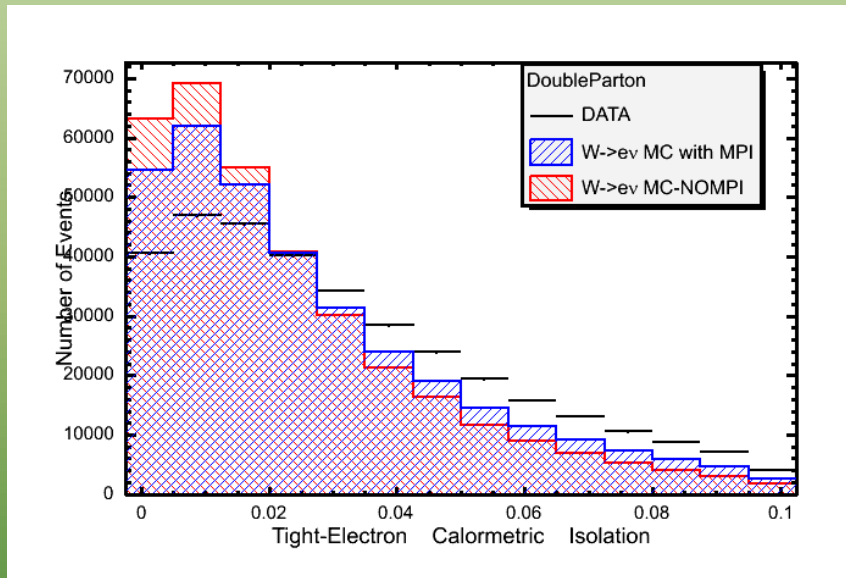
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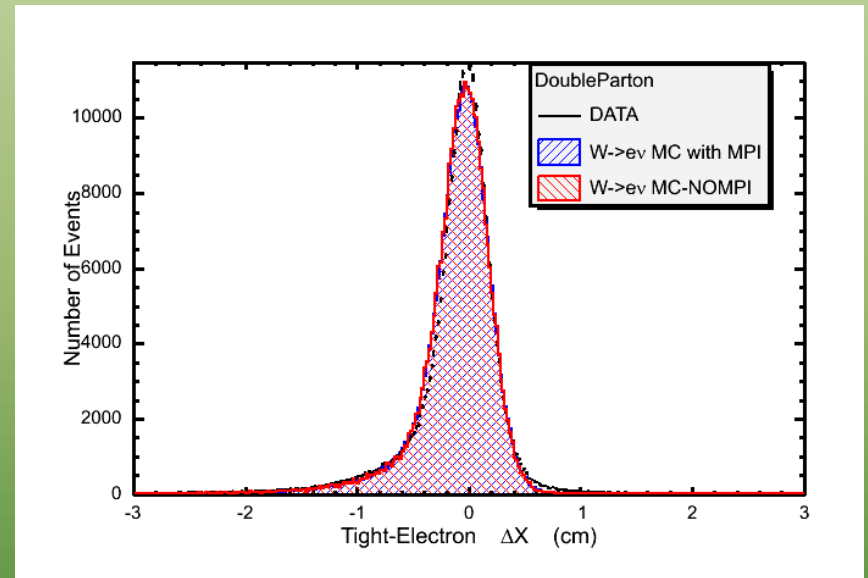
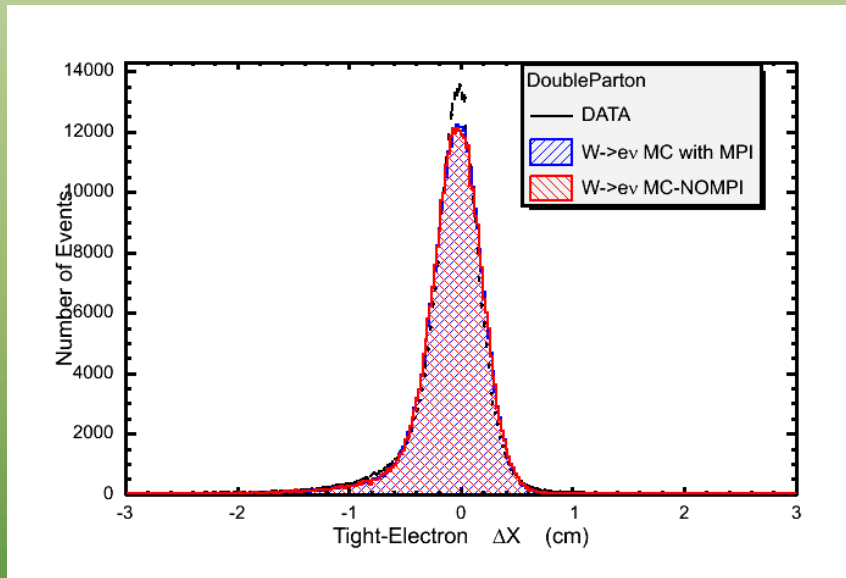
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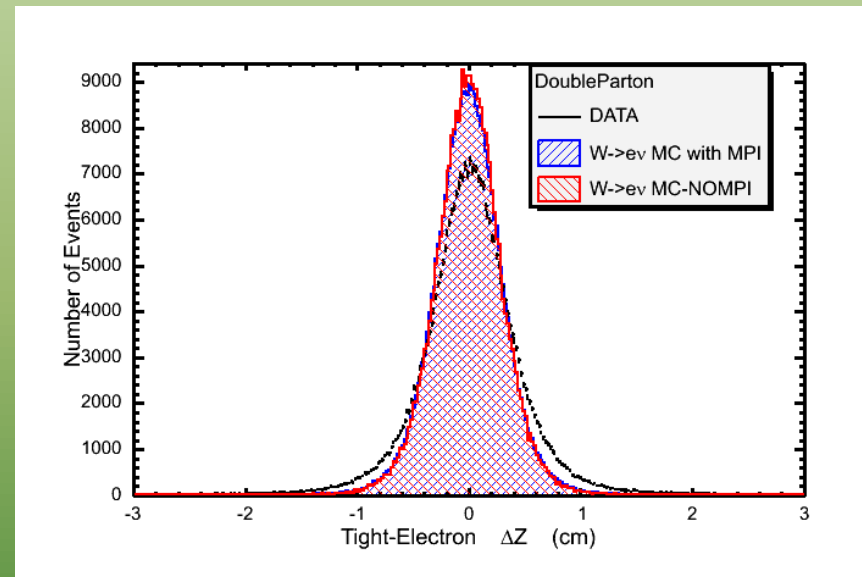
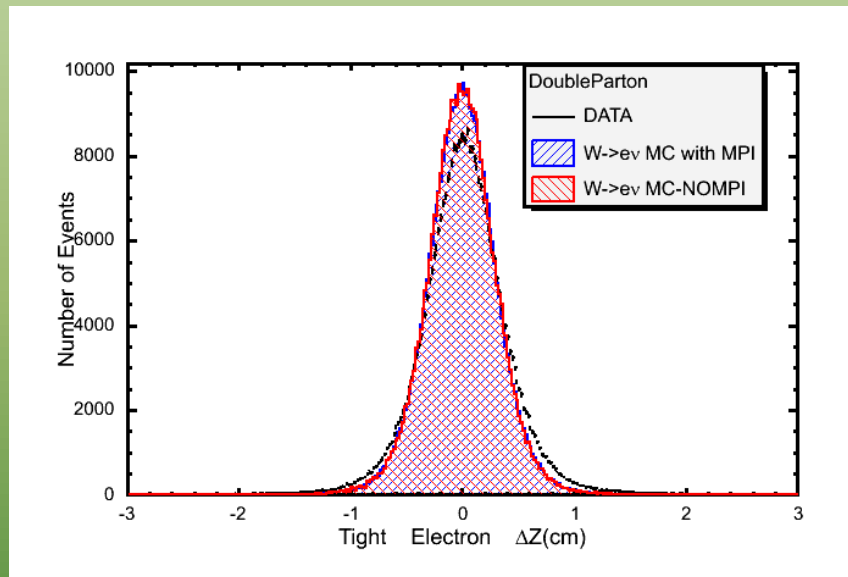
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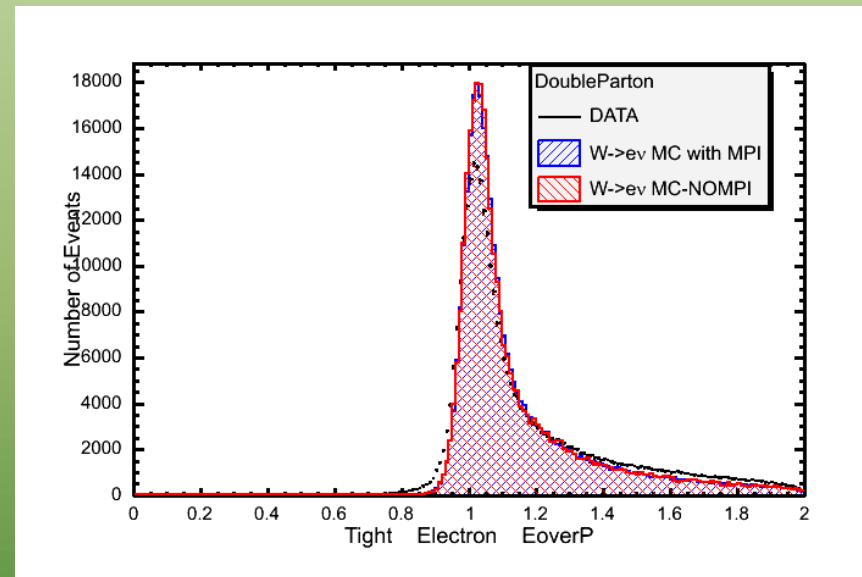
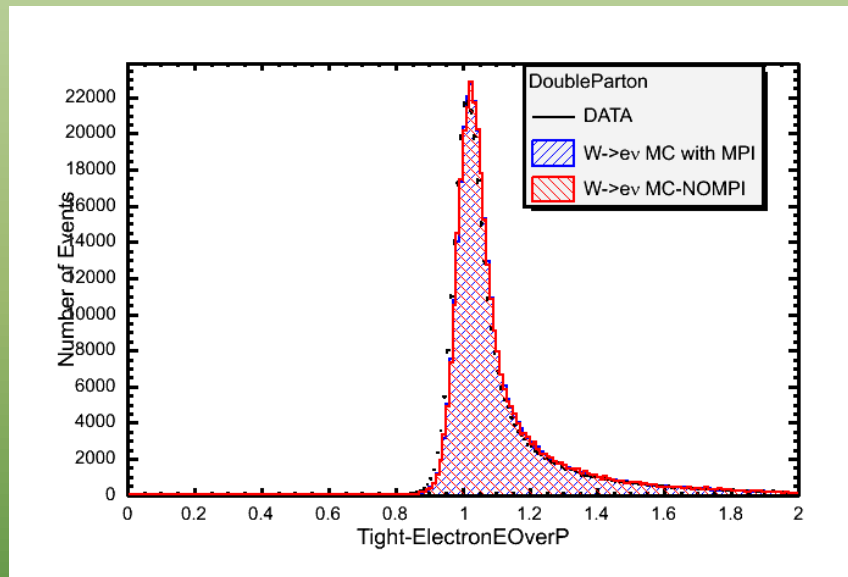
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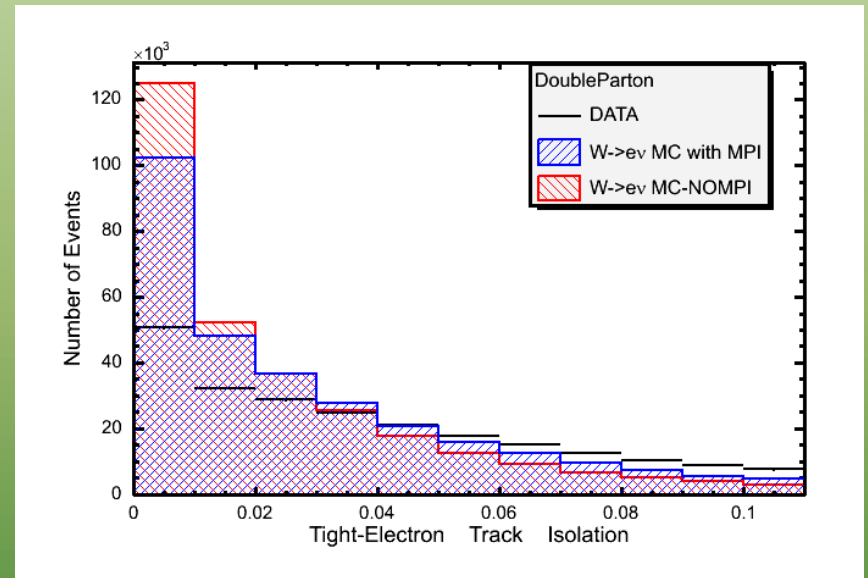
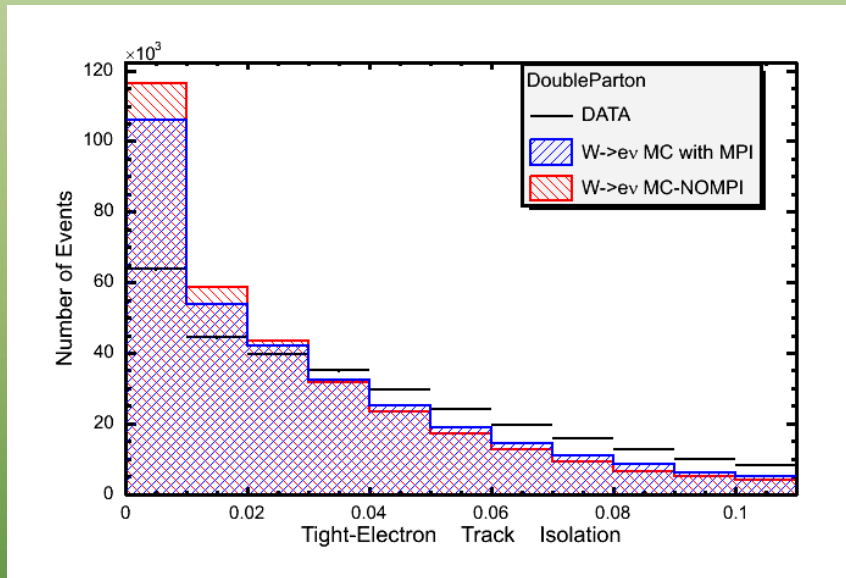
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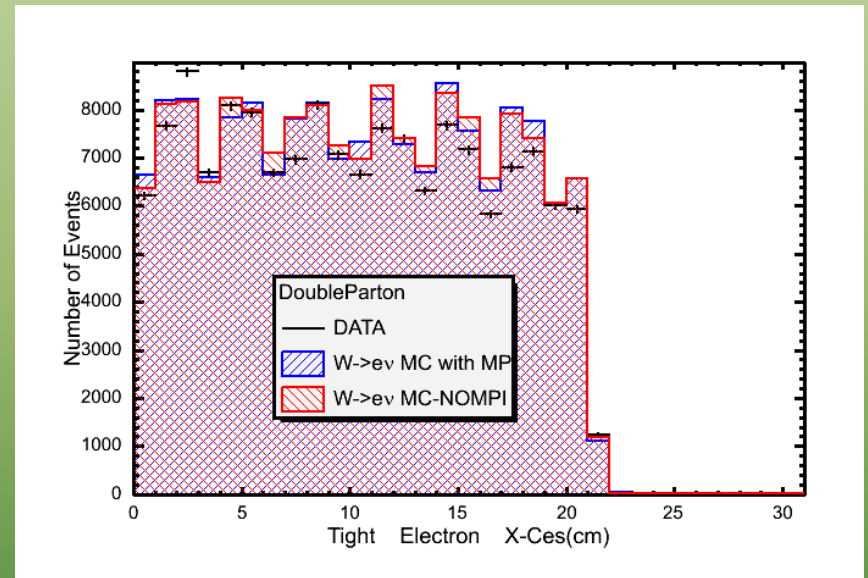
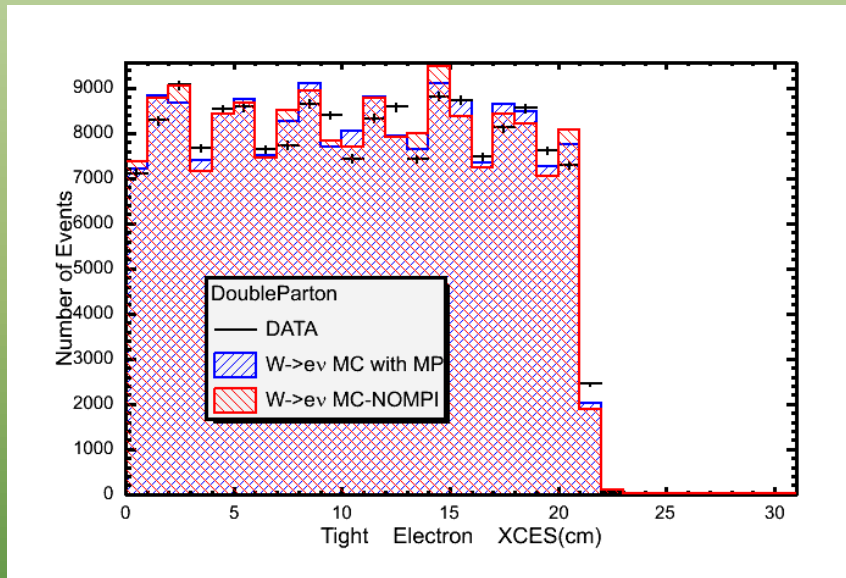
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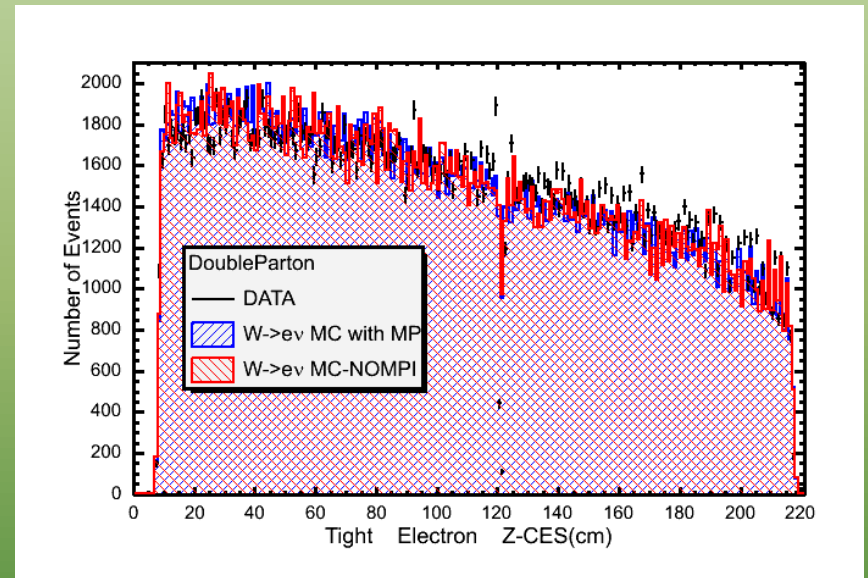
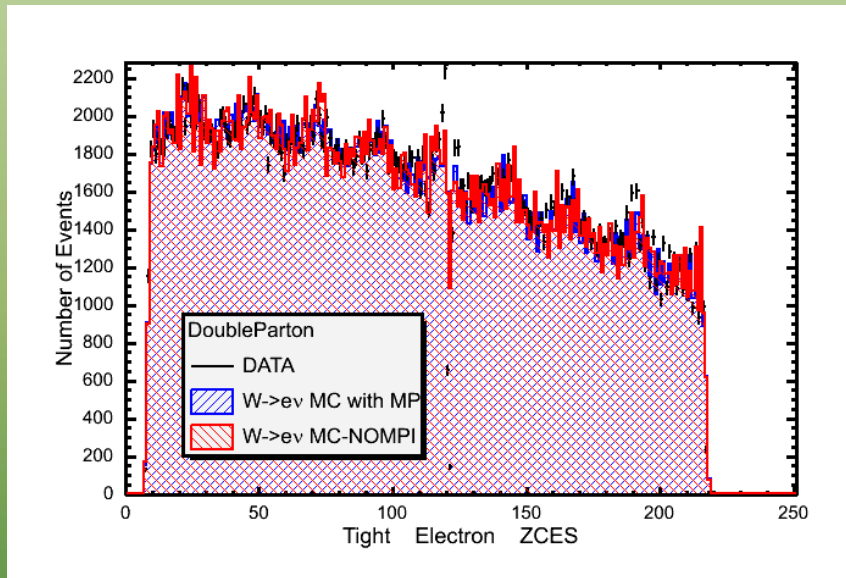
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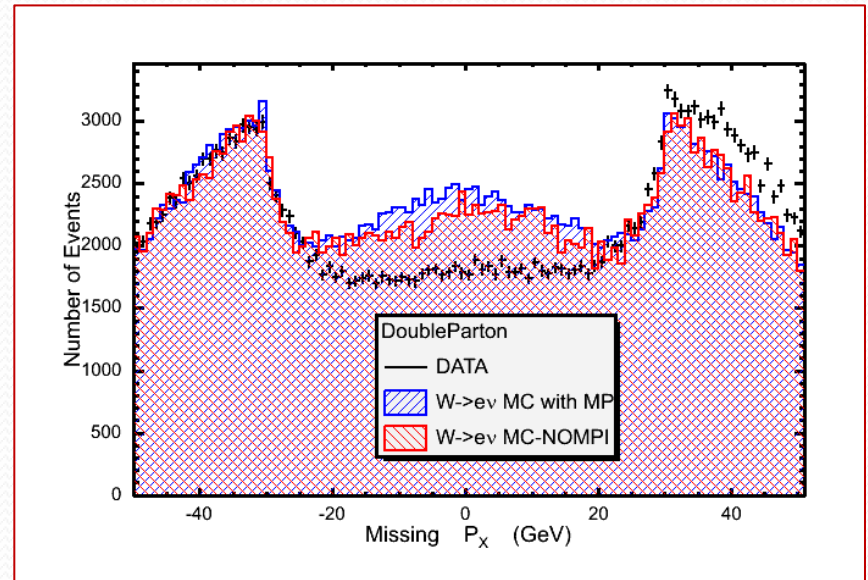
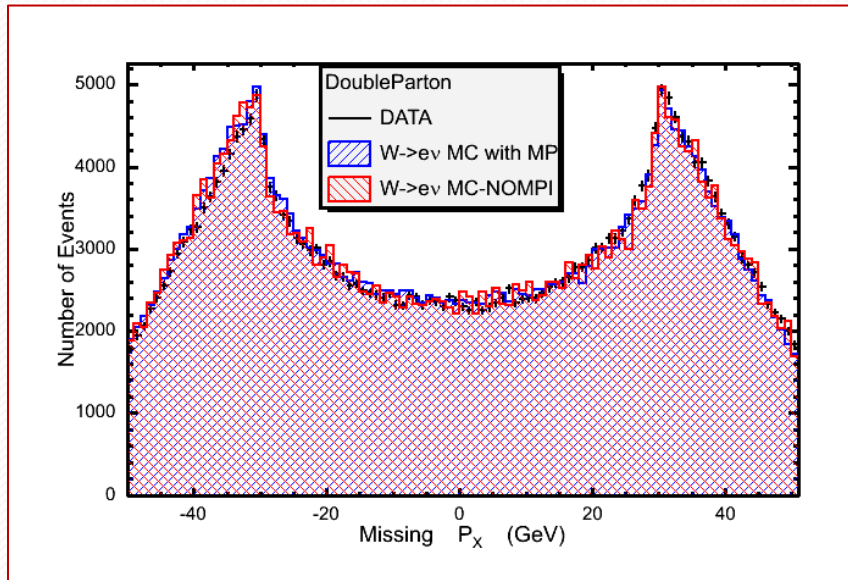
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MET/TRANSVERSE MASS



$\Delta\phi(\text{Electron}, \text{MET}) > 2.5$

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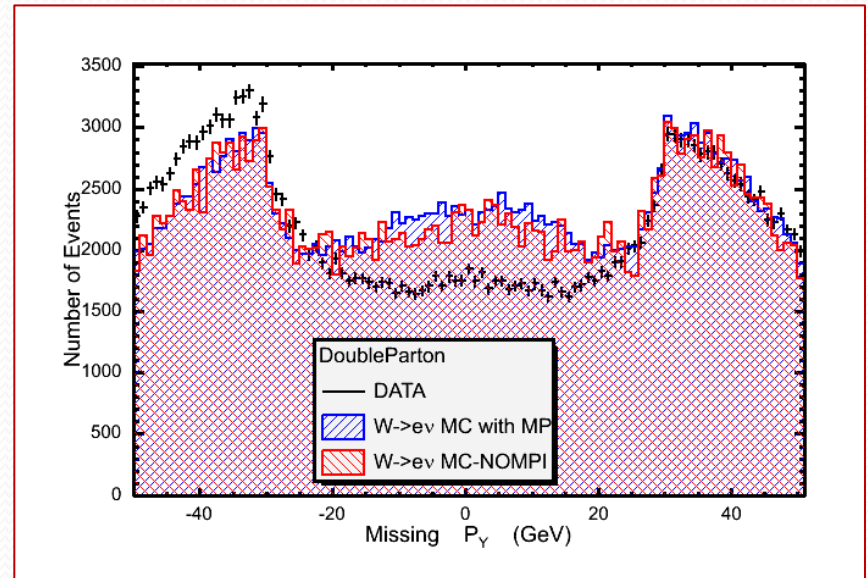
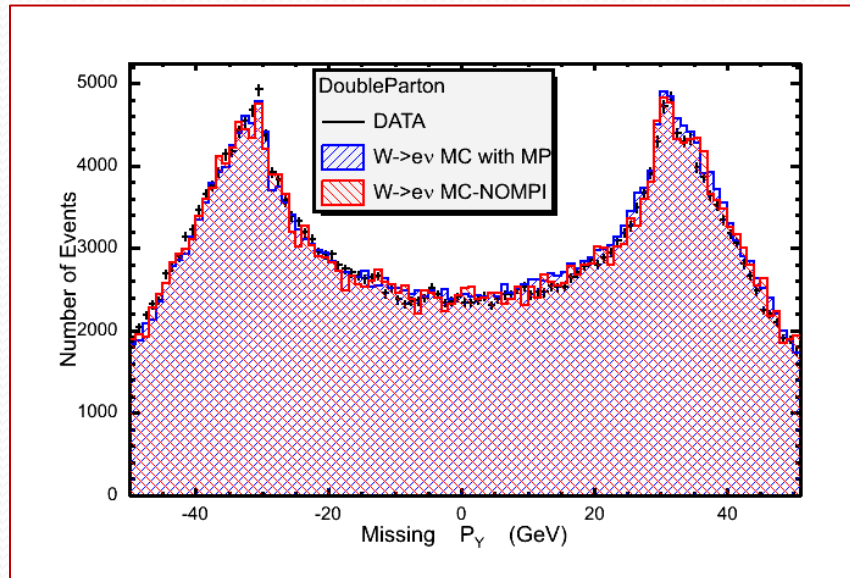


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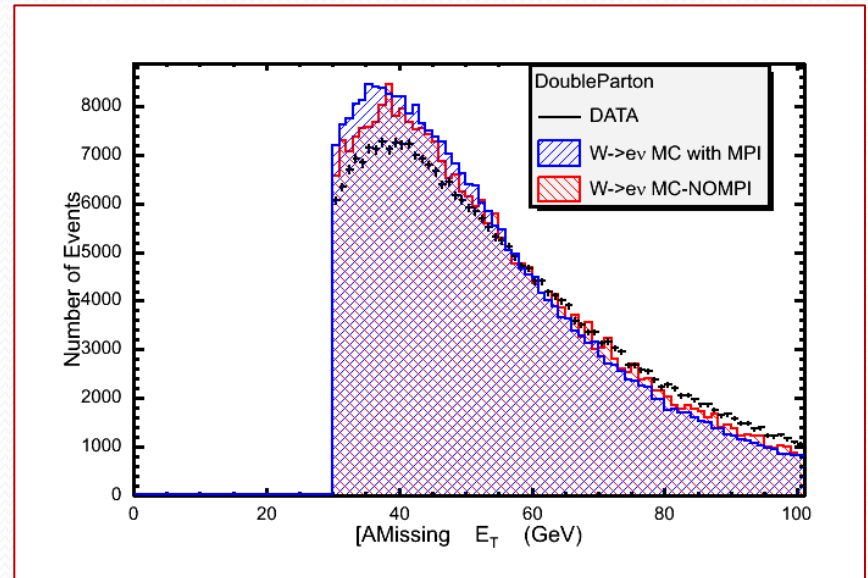
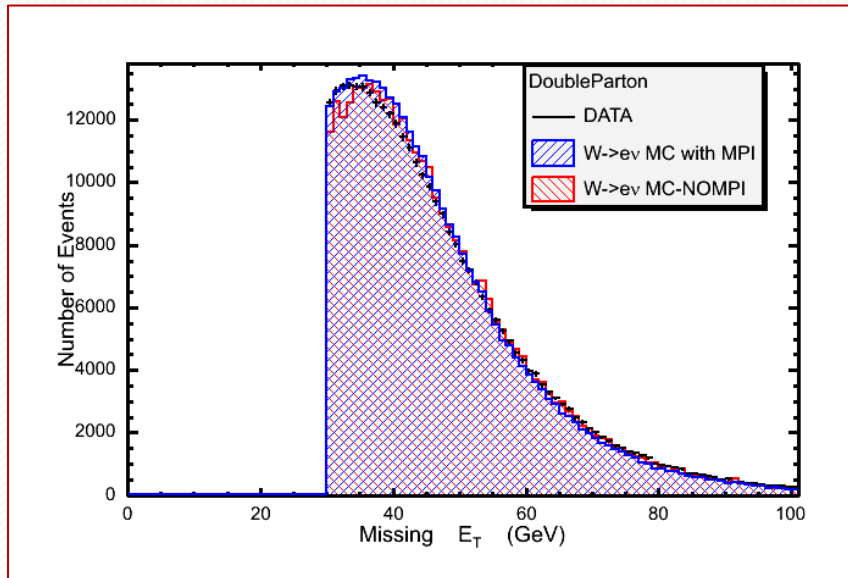


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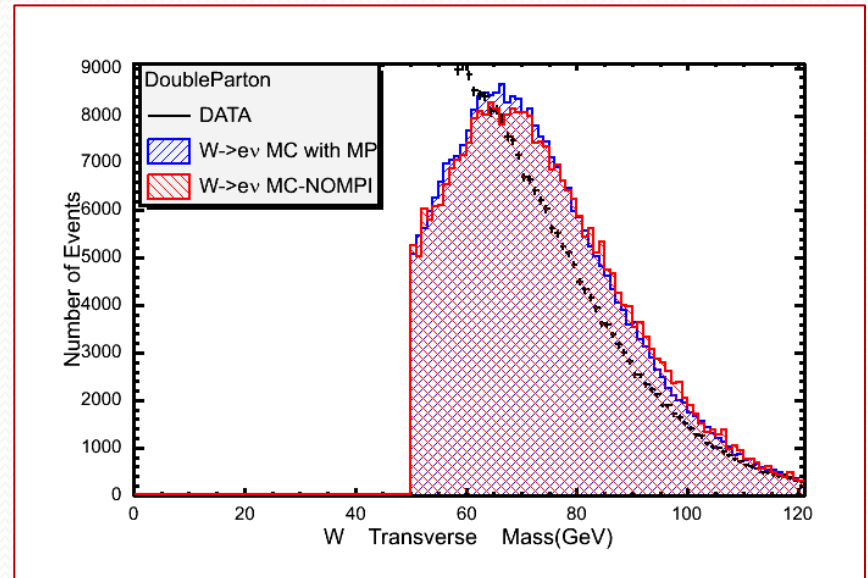
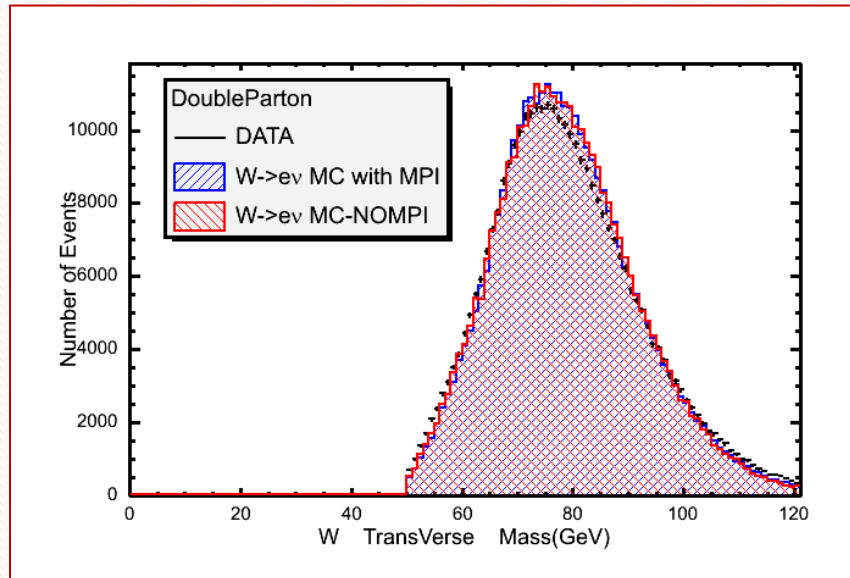


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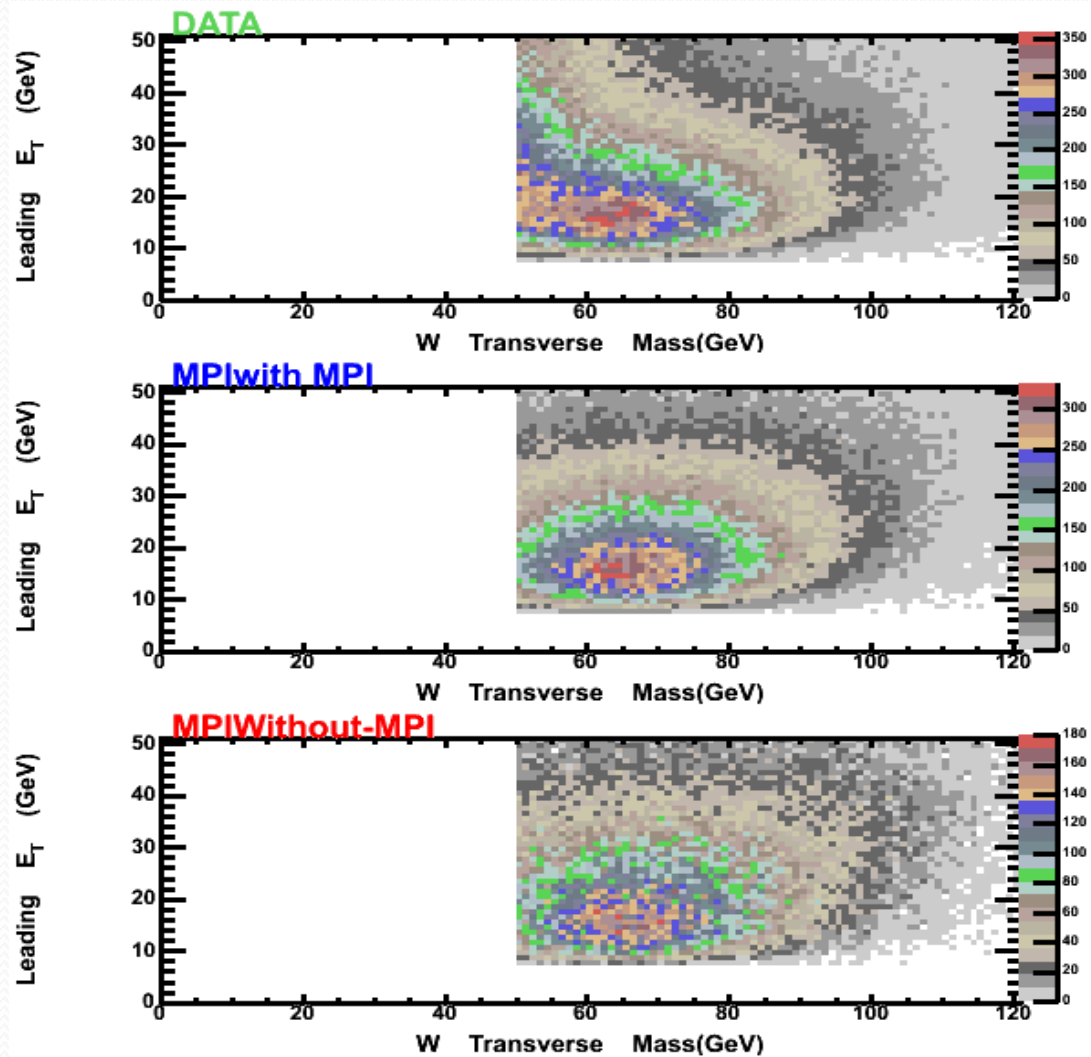
$\Delta\phi(\text{Electron}, \text{MET}) < 2.5$



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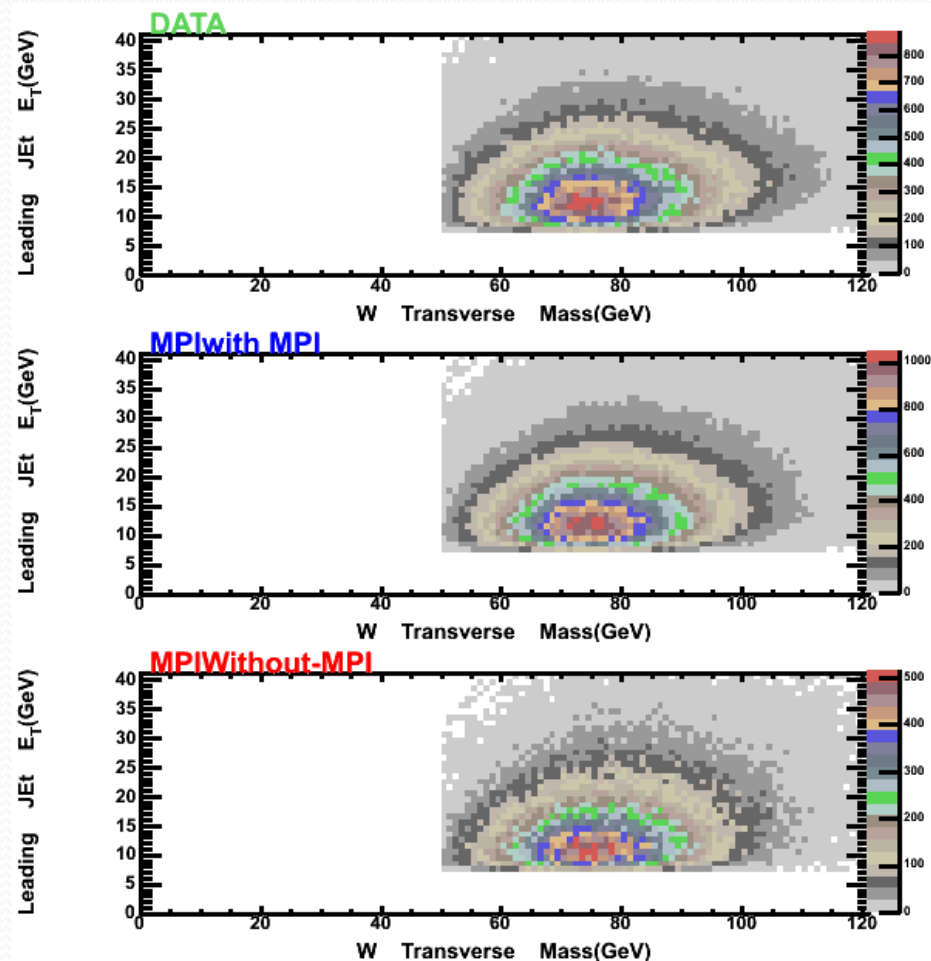
MET/TRANS VERSE MASS

- $\Delta\phi(\text{Electron, MET}) < 2.5$



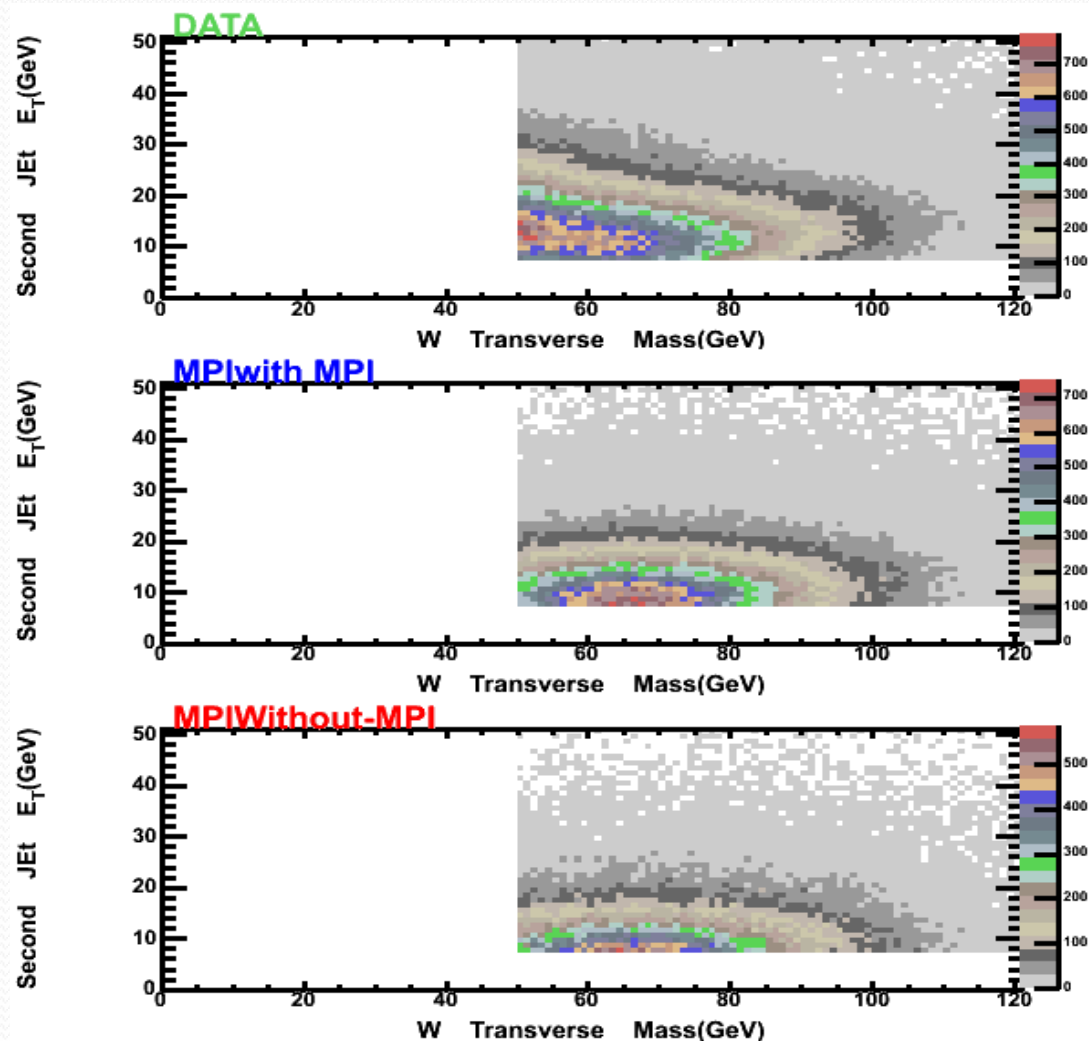
MET/TRANS VERE MASS

- $\Delta\phi(\text{Electron}, M_{\text{ET}}) > 2.5$



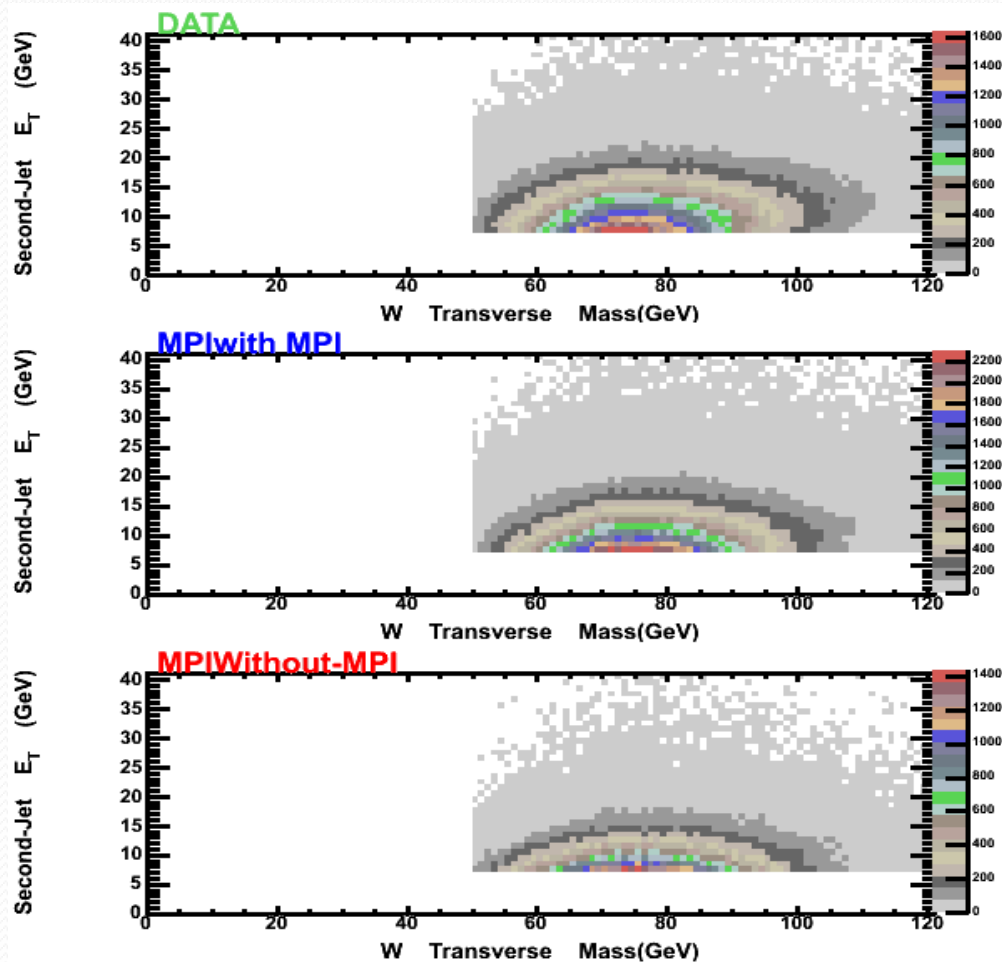
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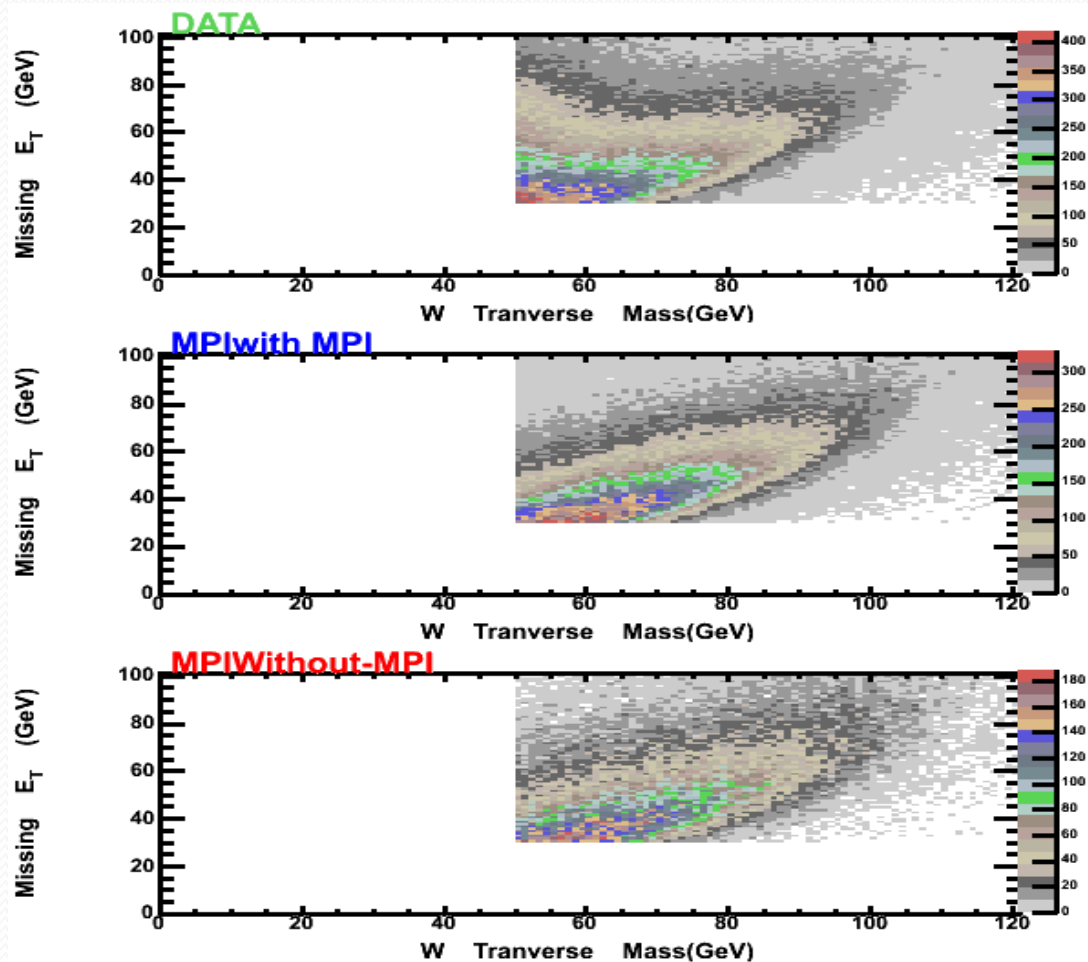
MET/TRANS VERE MASS

- $\Delta\phi(\text{Electron}, M_{ET}) > 2.5$



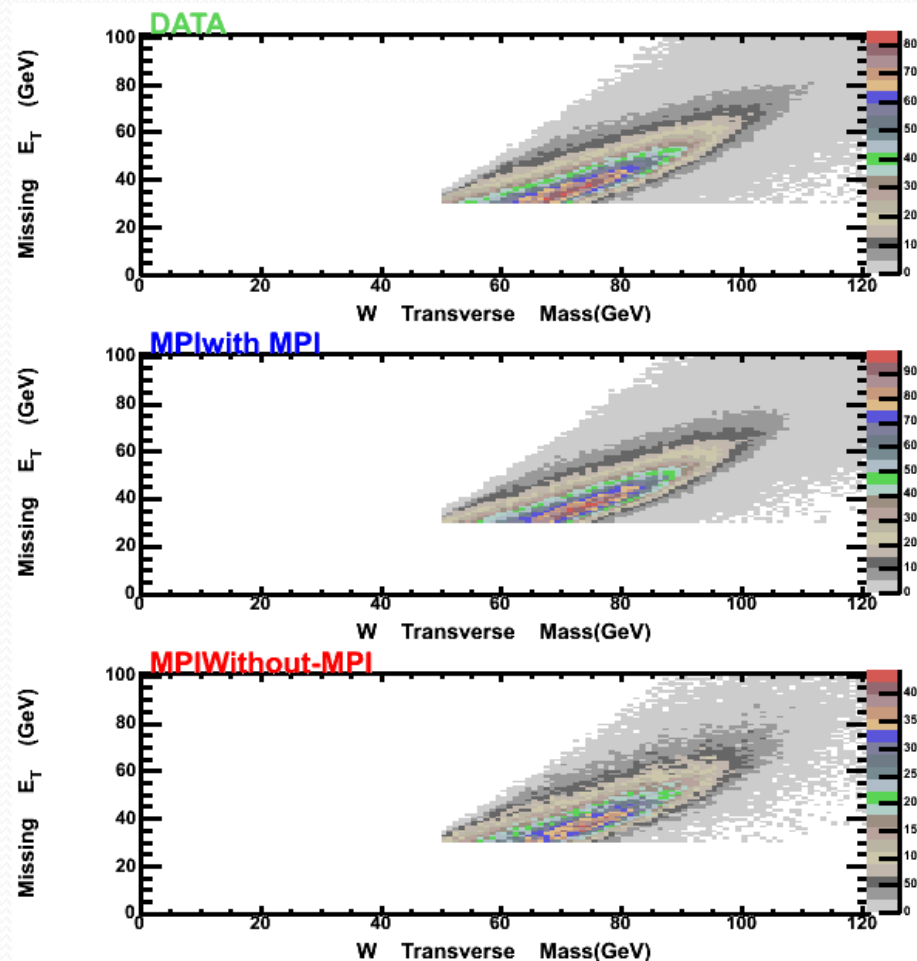
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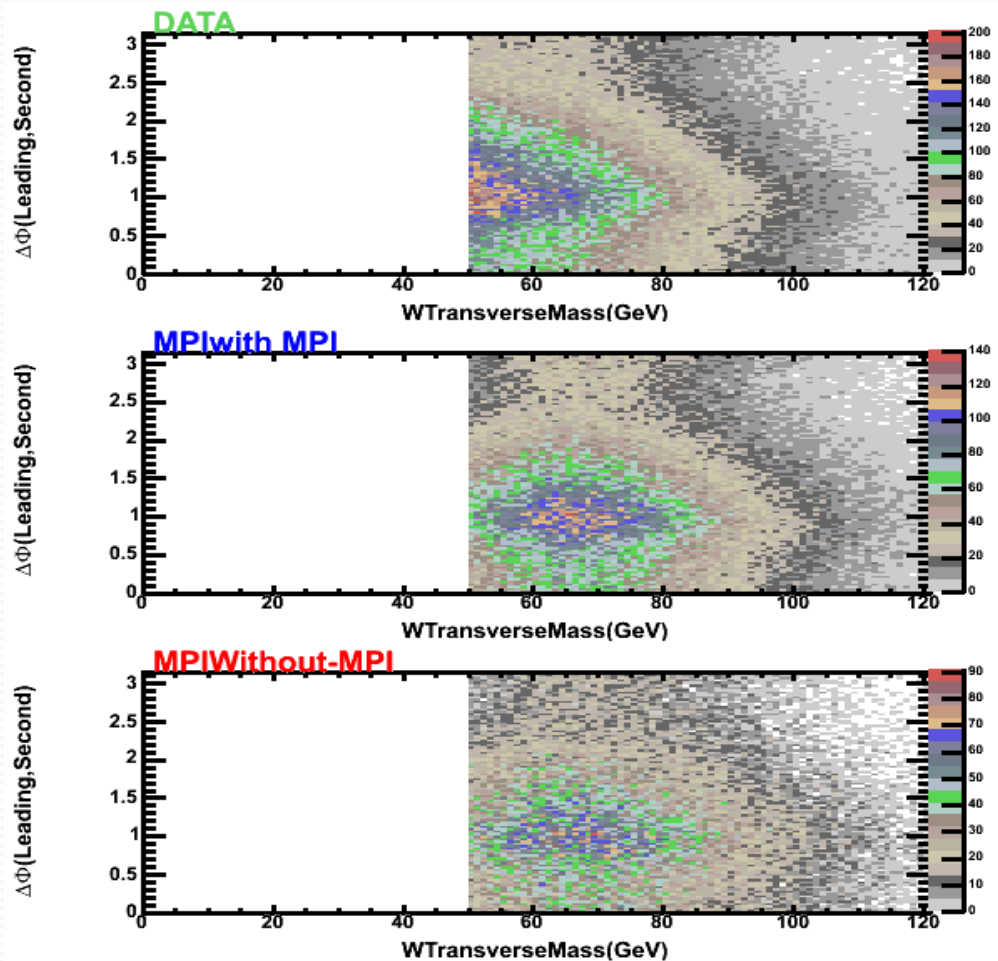
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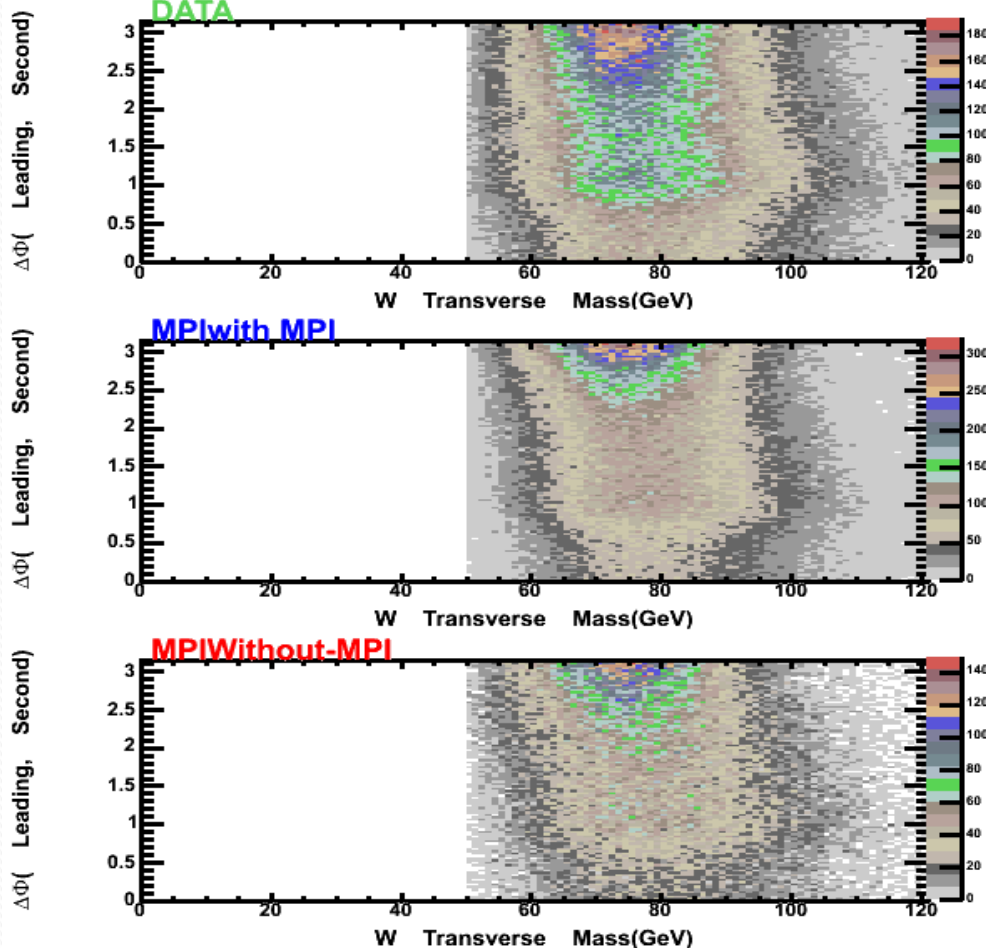
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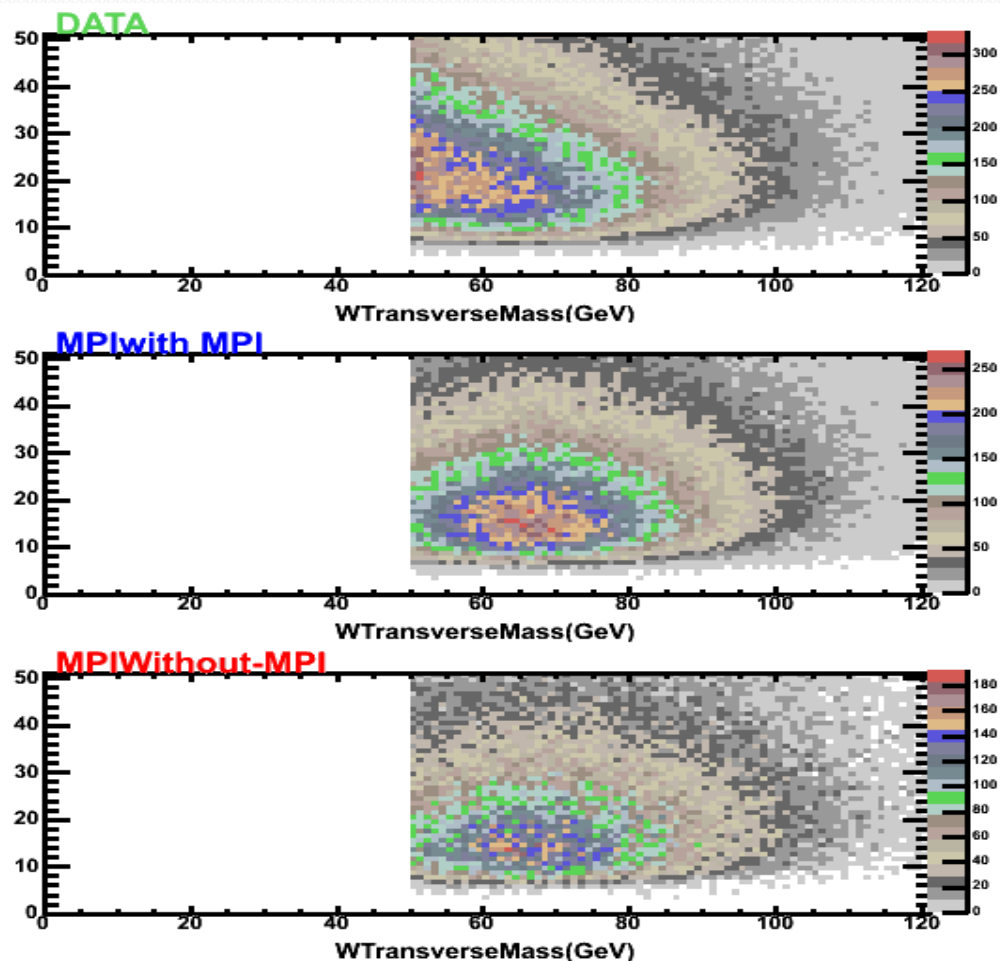
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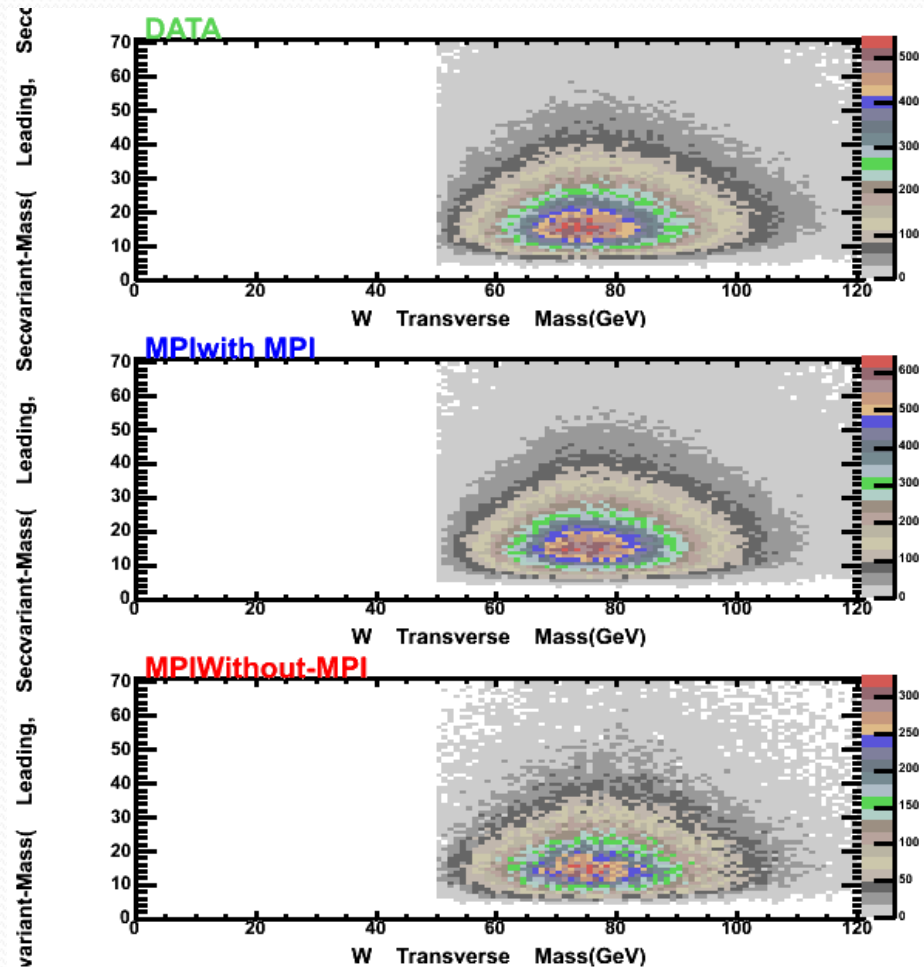
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Invariant-Mass(Leading, Second Invariant-Mass(Leading, Second Invariant-Mass(Leading, Second



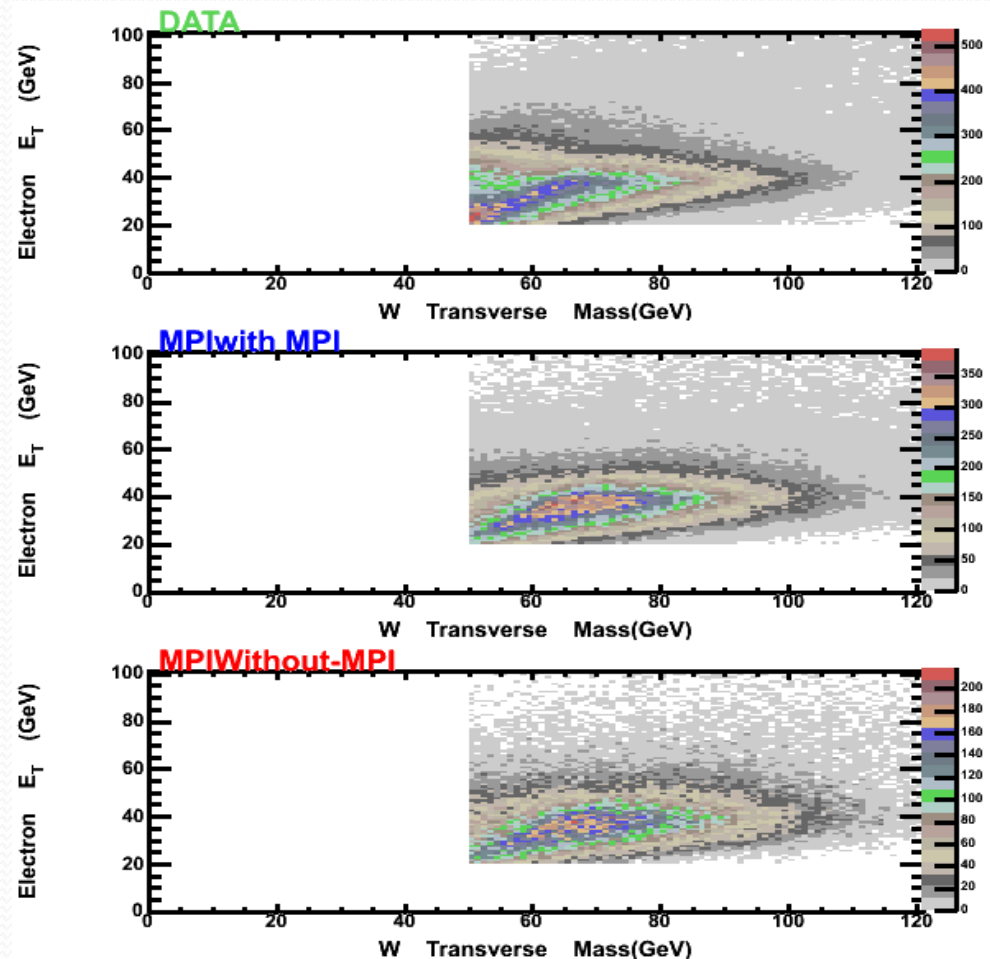
MET/TRANS VERE MASS

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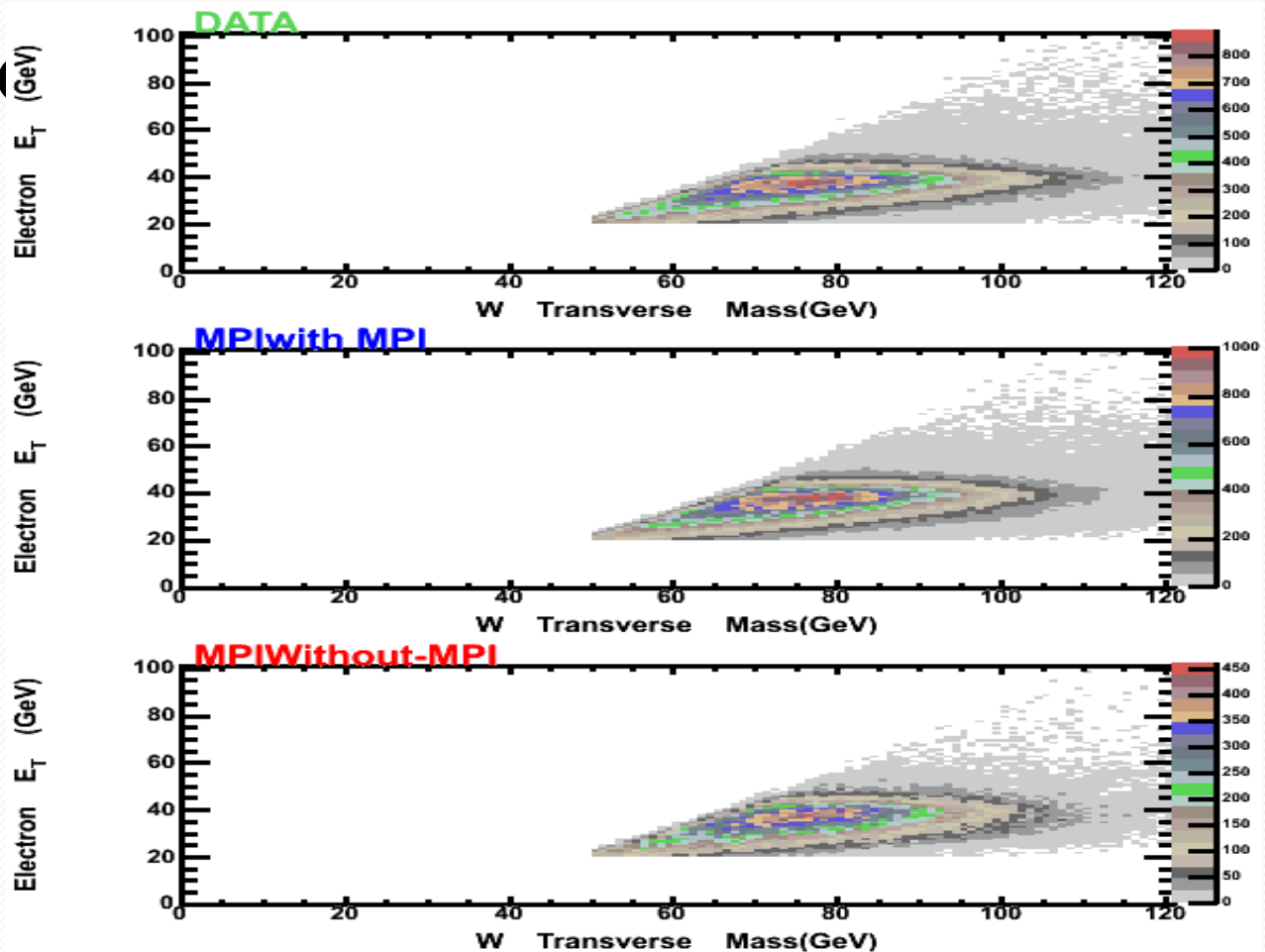
MET/TRANS VERSE MASS

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MET/TRANS VERSE MASS

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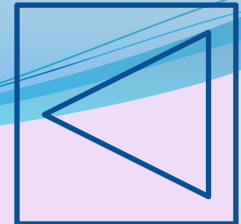


JET Selection- Comments.....



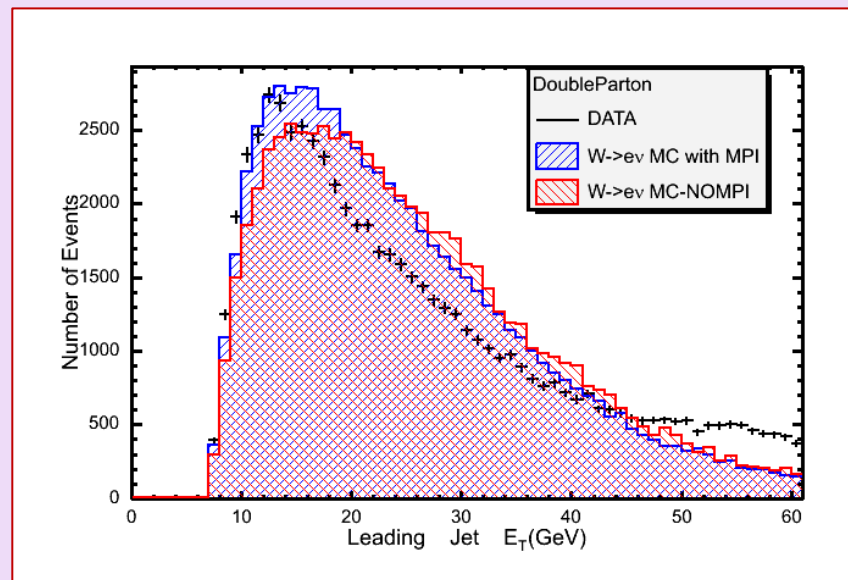
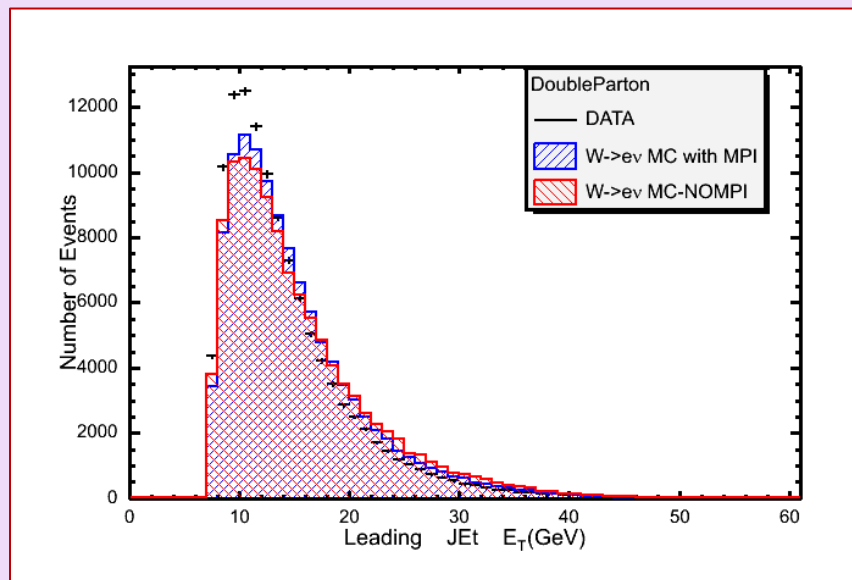
- Jet Corrected for L5 Jet Energy Scale Correction
- Jet $ET > 7 \text{ GeV}$ AND JET $|\eta| < 2.0$
- Soft -Jets are also selected between $(3, 7] \text{ GeV}$ AND JET $|\eta| < 2.0$ and these are L5 Corrected too.
- Only Jets with Atleast Two Tracks (Any kind of Tracks Associated with the Jet At the Ntuple Level)

JET VARIABLES



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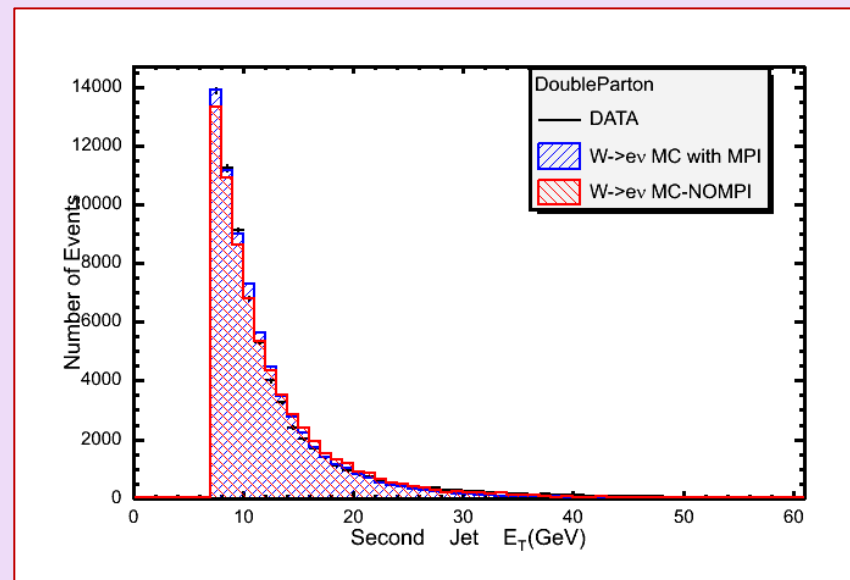
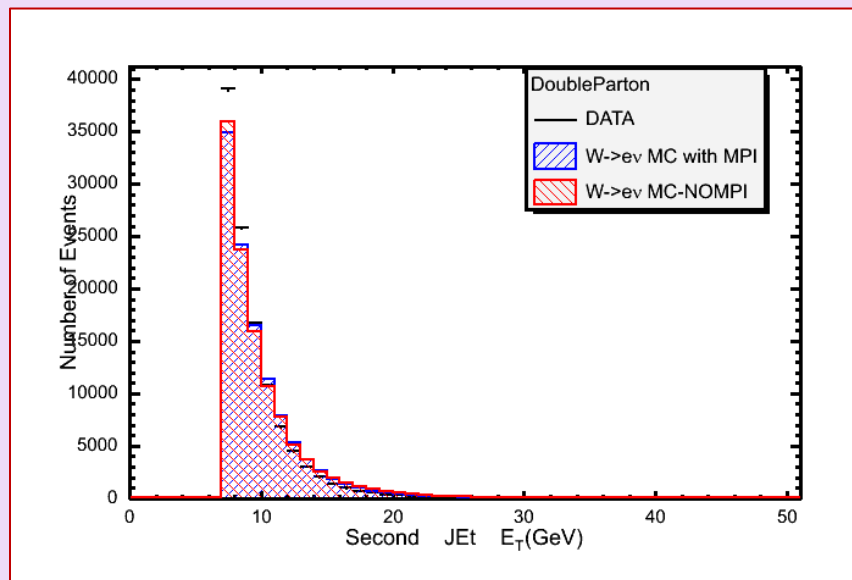


JET VARIABLES

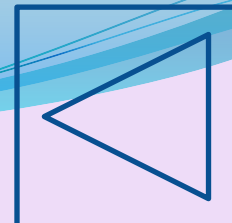


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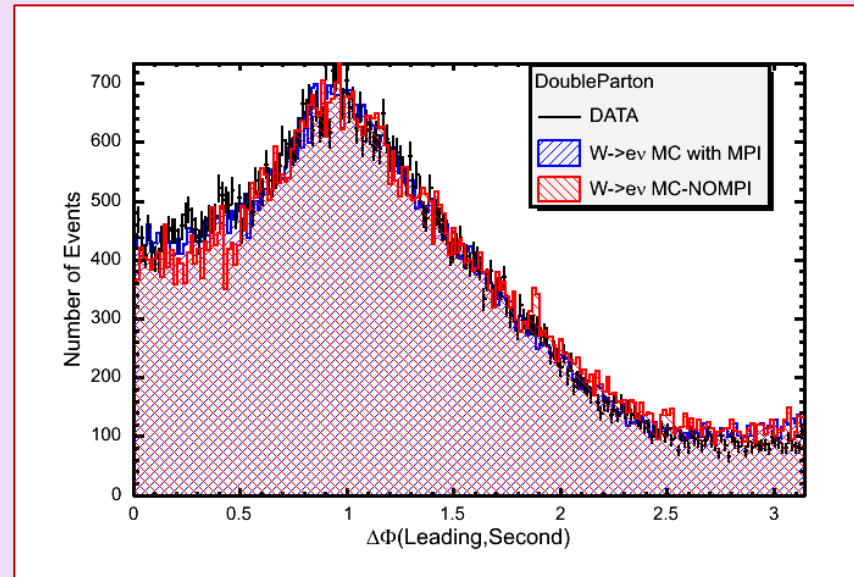
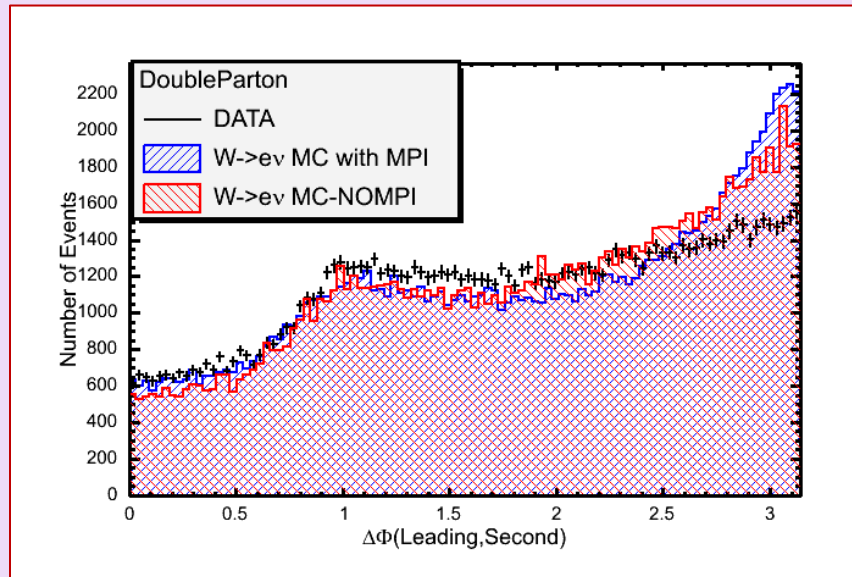


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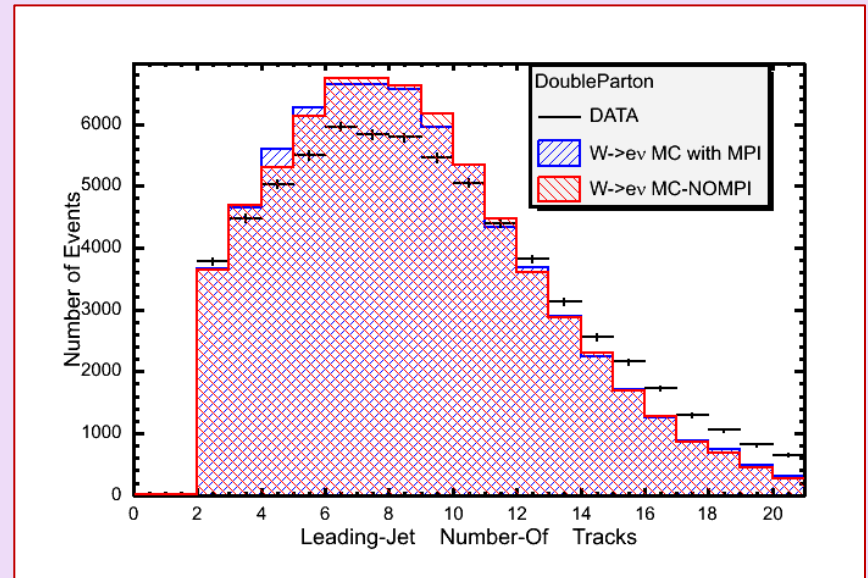
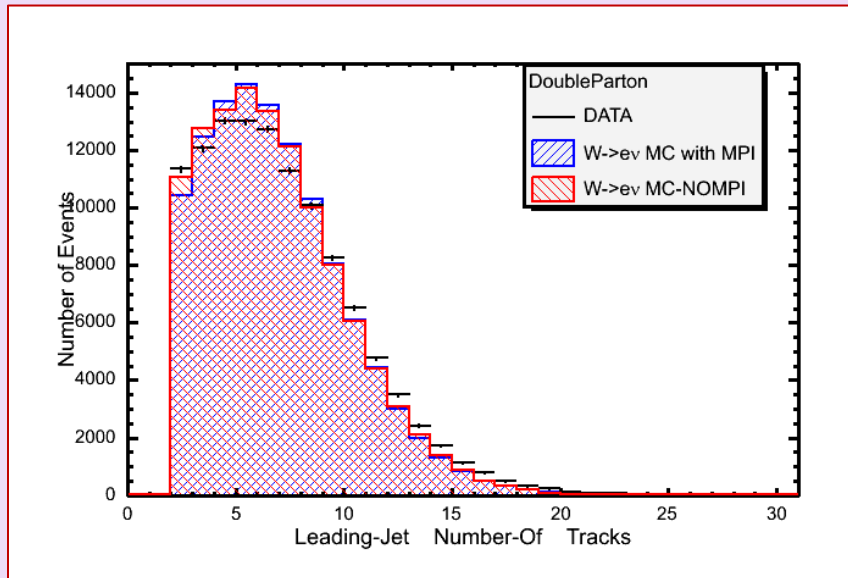
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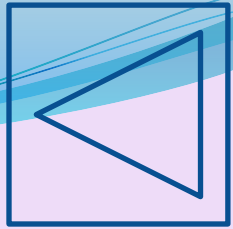
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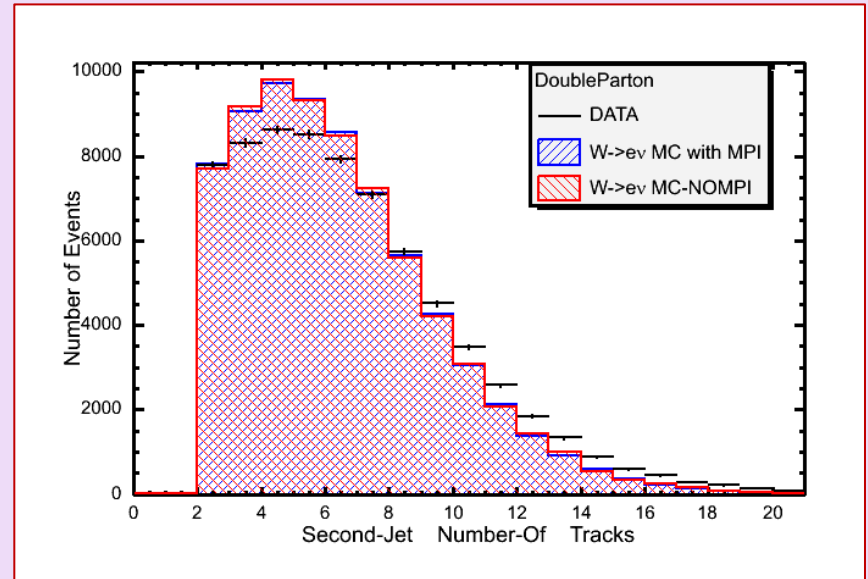
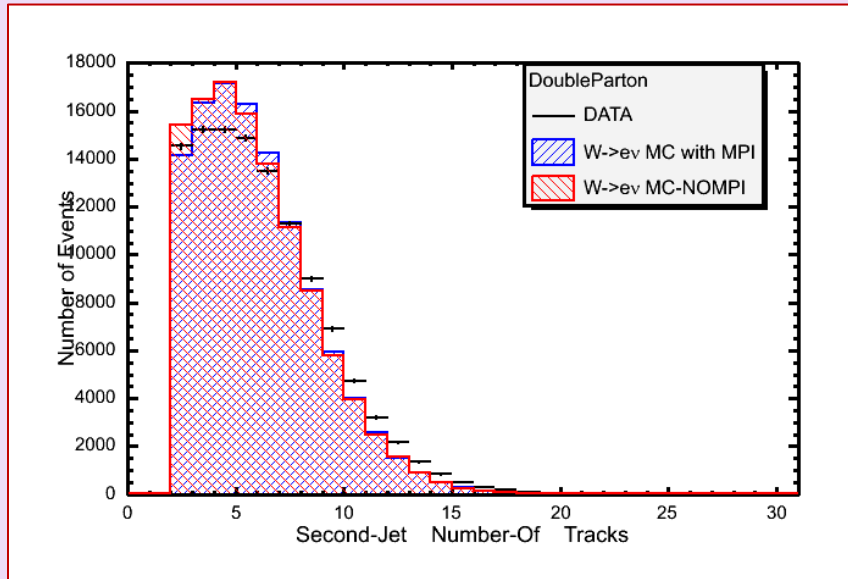


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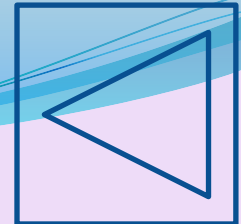


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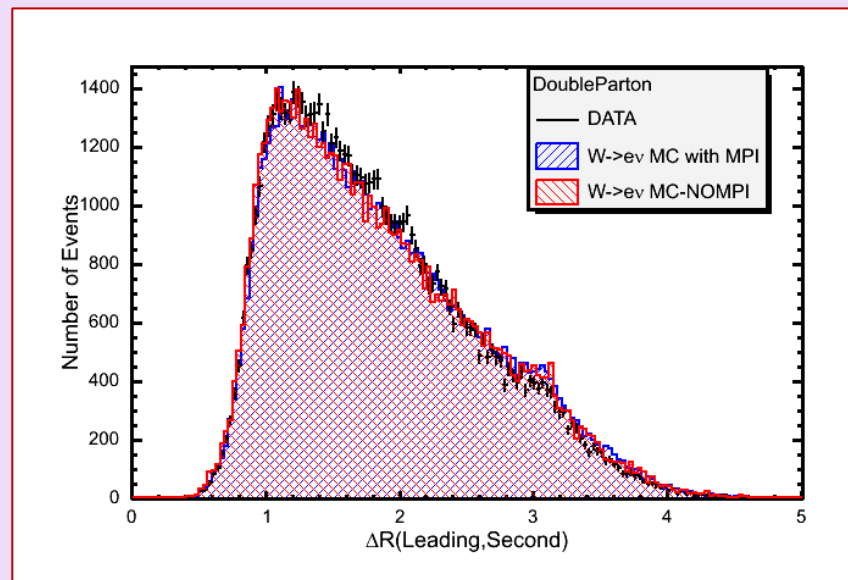
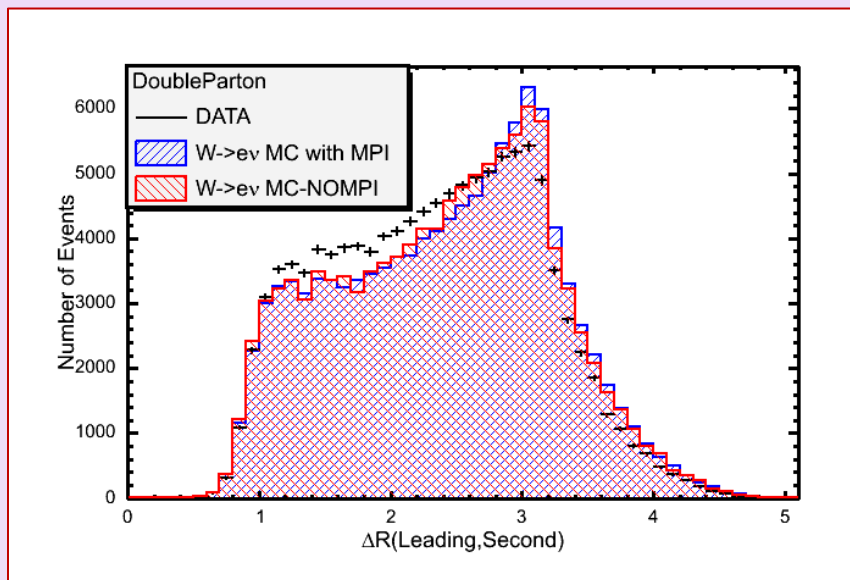


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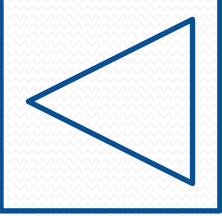
Jet Tracks History- Selection



- Tracks are associated to the Jet at the ntuple level based on the (η, ϕ) space wrt Jet $(0,0,0)$
- COT and SVX Tracks are naturally associated with the Jet
- SVX Tracks have Track Z resolution $\sim$ few microns while COT Tracks have Track Z resolution $\sim$ few mm
- Only SVX Tracks are chosen to take advantage of their good Z resolution
- The Tracks are also SVX Beam Corrected to keep up with the Track Z resolution

Weighted Jet Z Calculation From TrackZ

From the Tracks already associated with the Jet Only SVX tracks(Track Algorithm 11) are selected



$$\text{Track_Z_Error_Weighted_Jet_Z} = \sum_{\text{all_SVX_tracks}} (\text{Track_Z_Error} * \text{Track_Z})$$

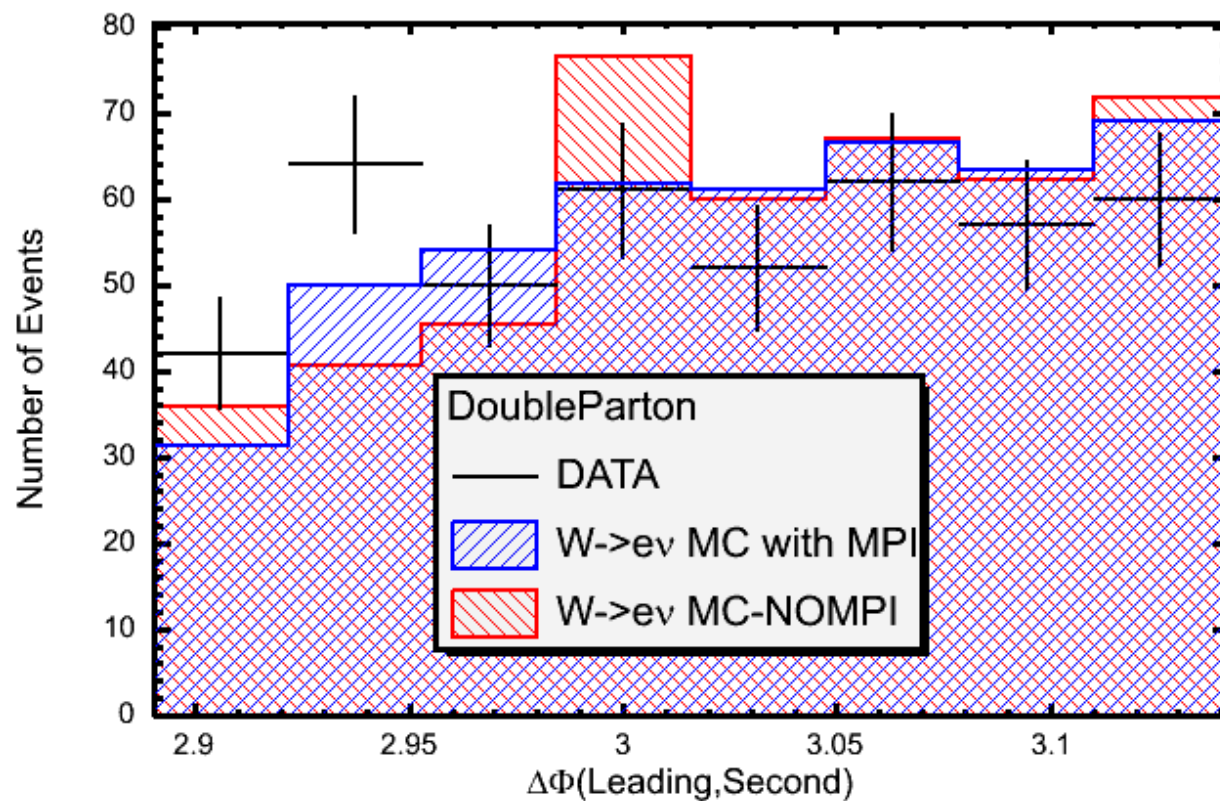
Spread of the $\Delta Z(\text{Jet_Average_Z} - \text{Track_Z})$ is found be $< \sim 0.04$ cm

Only Those Tracks with $\Delta Z(\text{Jet_Average_Z} - \text{Track_Z}) < 0.04$ cm is considered and Jet Average Z is Recalculated

Another Iteration on the Jet_Average_Z Calculation is done to obtain the Final Jet_Z

W+ONLY-TWOJETS/ $\Delta\phi(\text{Electron},\text{MET})>2.5/$

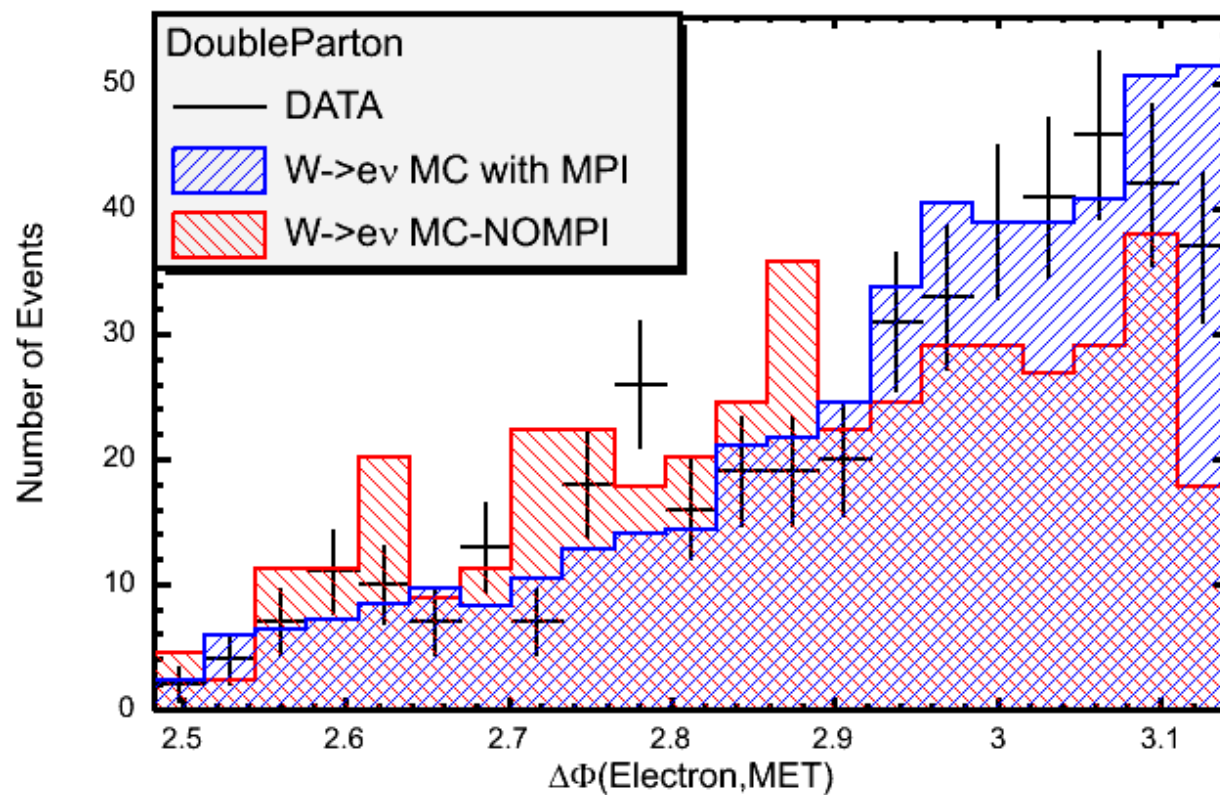
$\Delta Z(\text{Electron},\text{Leading})<0.04$ AND $\Delta Z(\text{Electron},\text{Second})<0.04$
AND $\Delta Z(\text{Second},\text{Leading})<0.04$ cm



•DeltaZ

W+ONLY-TWOJETS/ $\Delta\phi(\text{Electron},\text{MET}) > 2.5/$

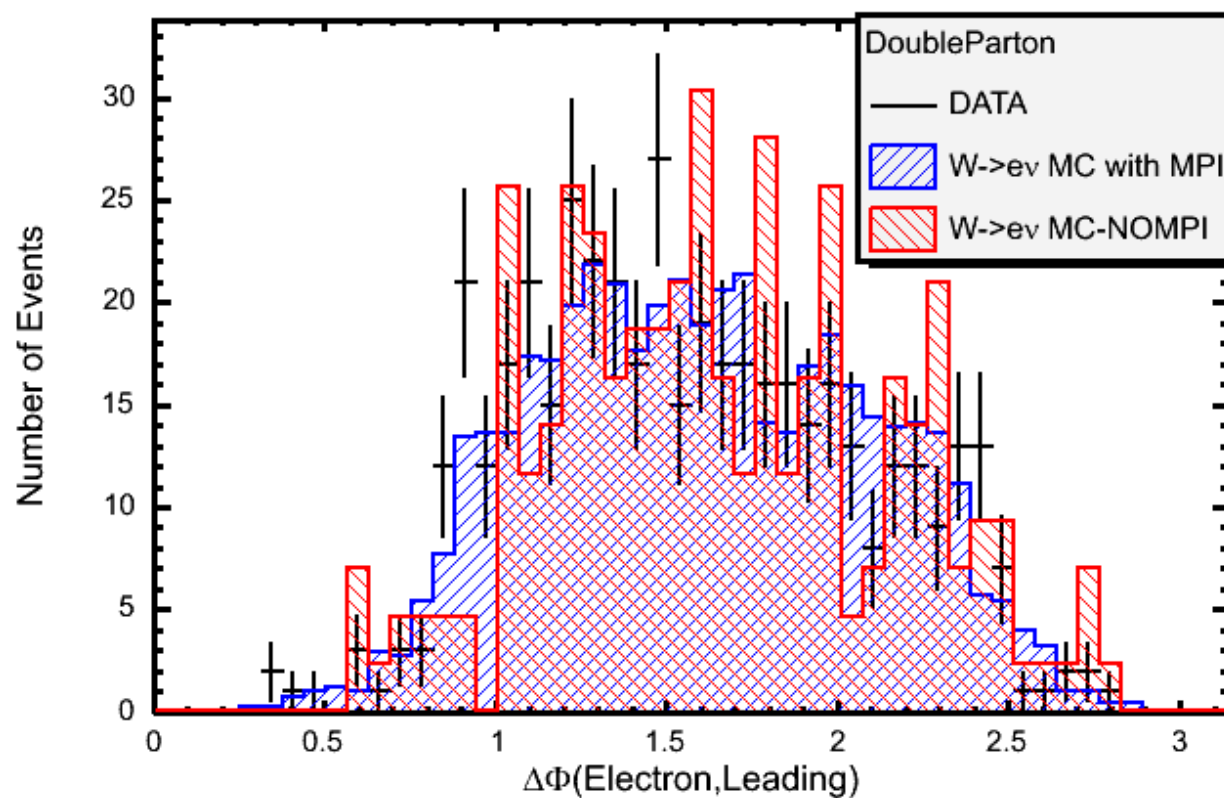
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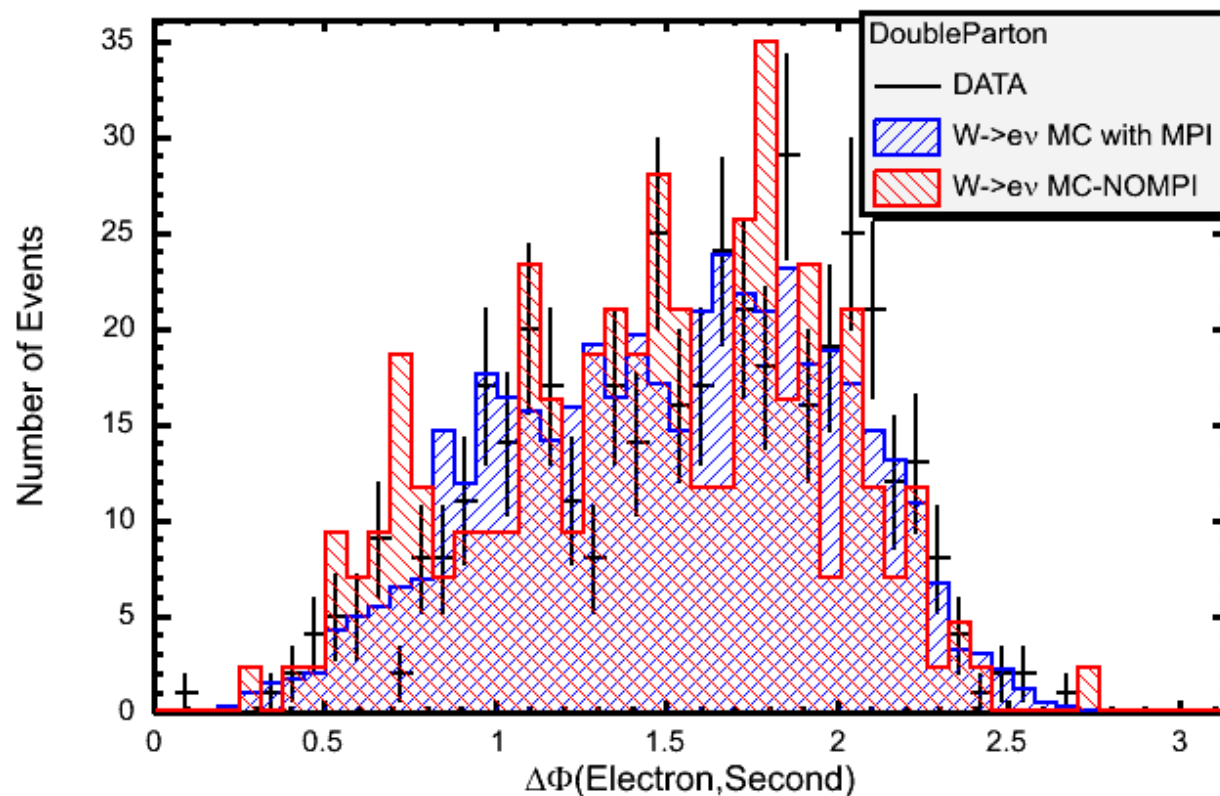
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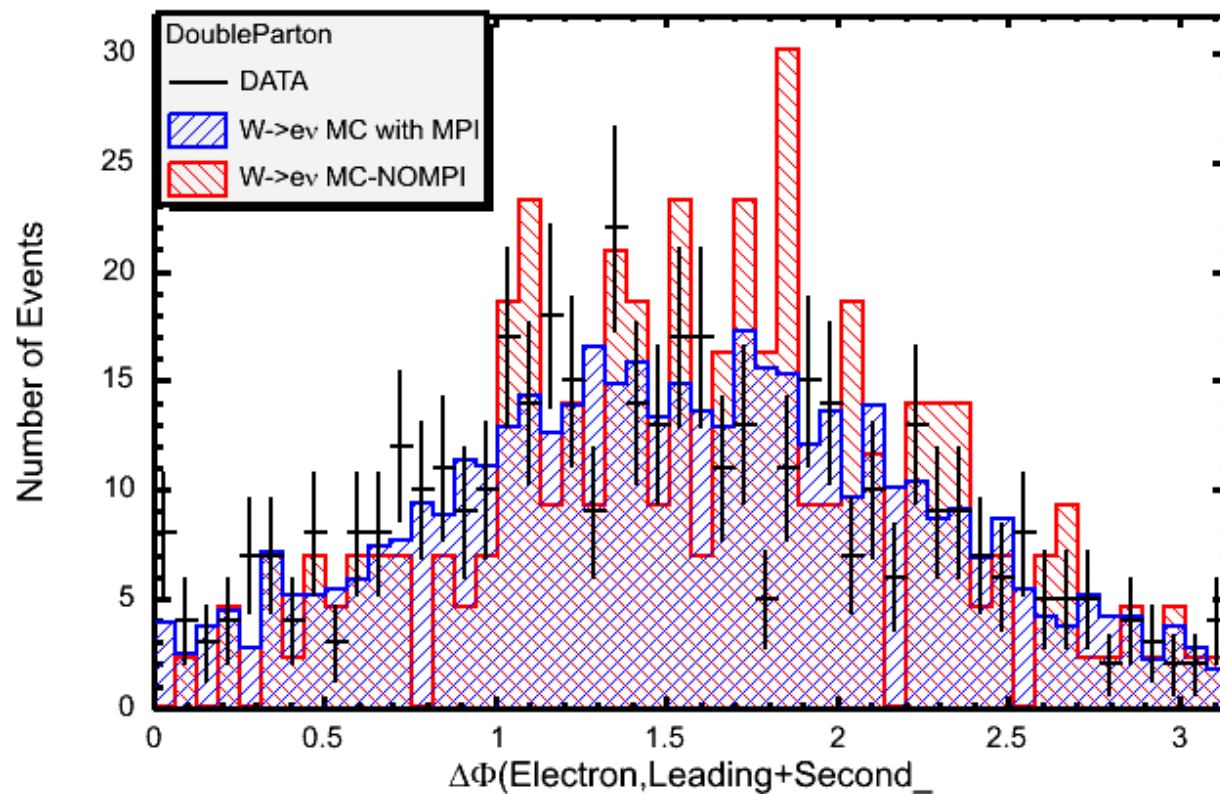
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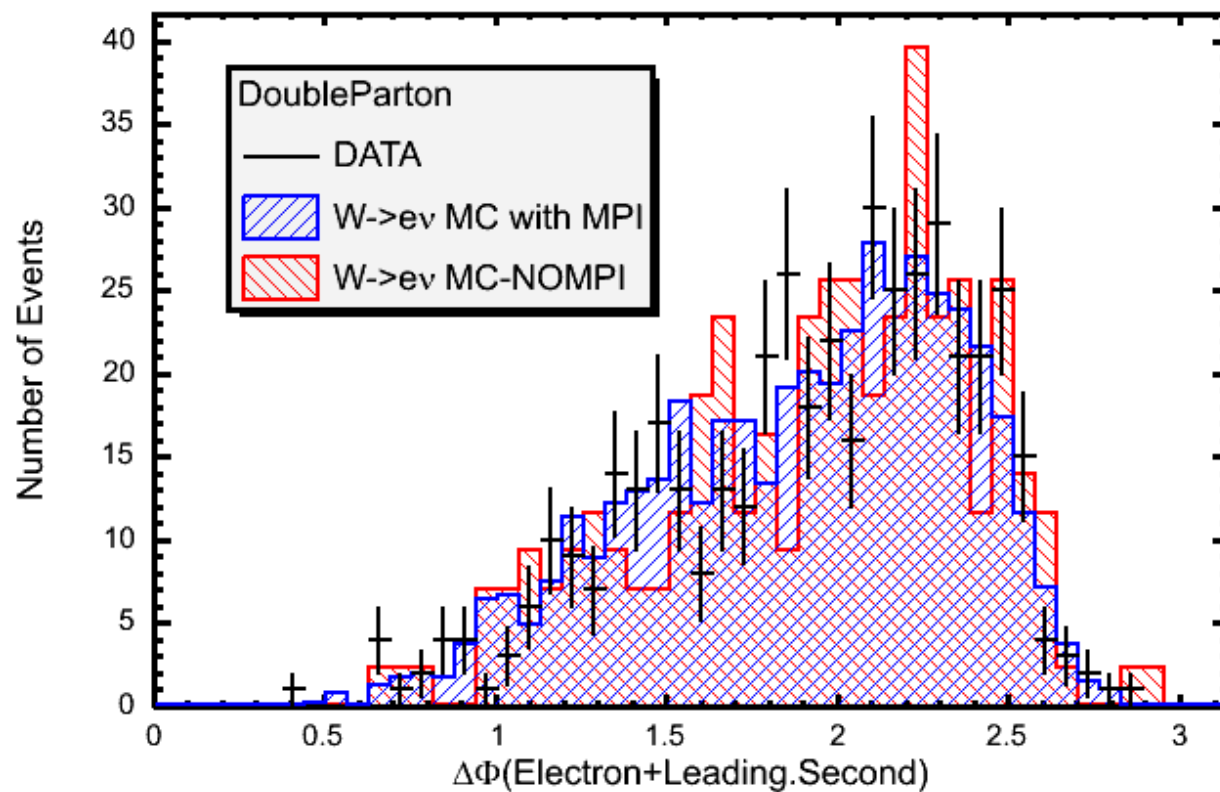
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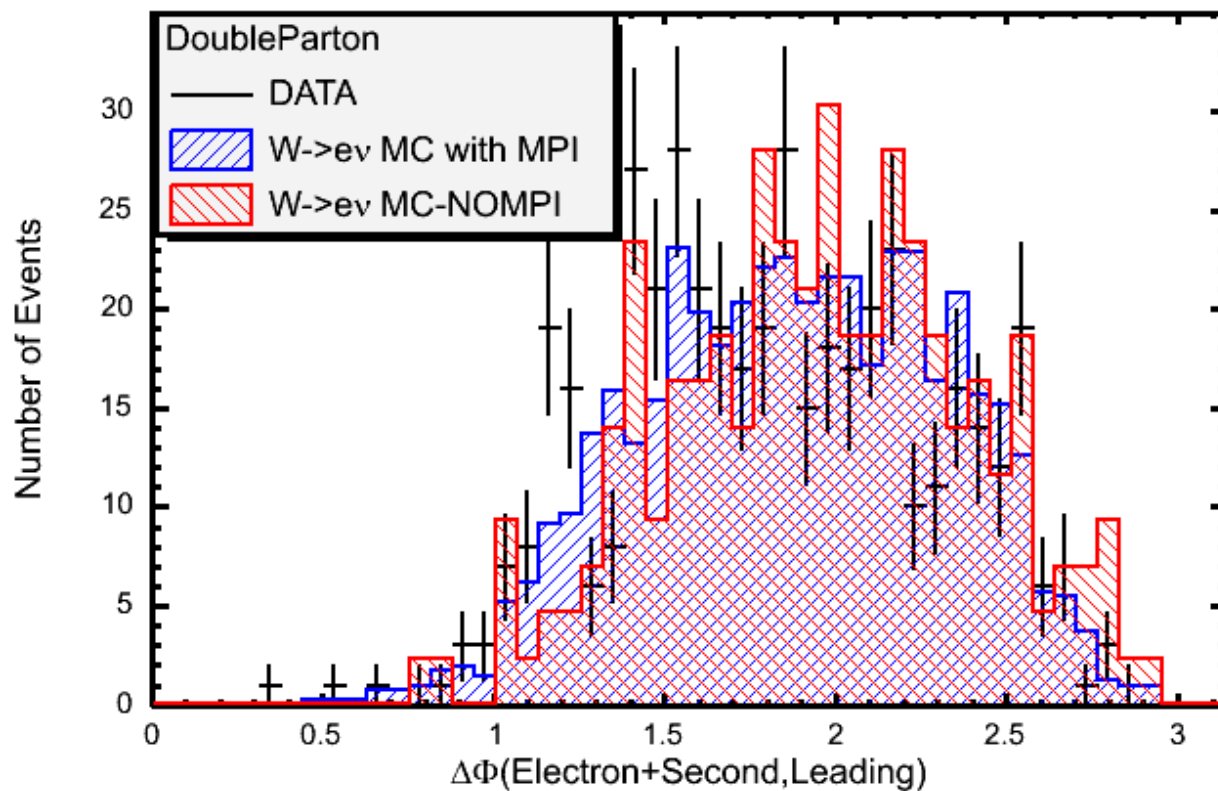
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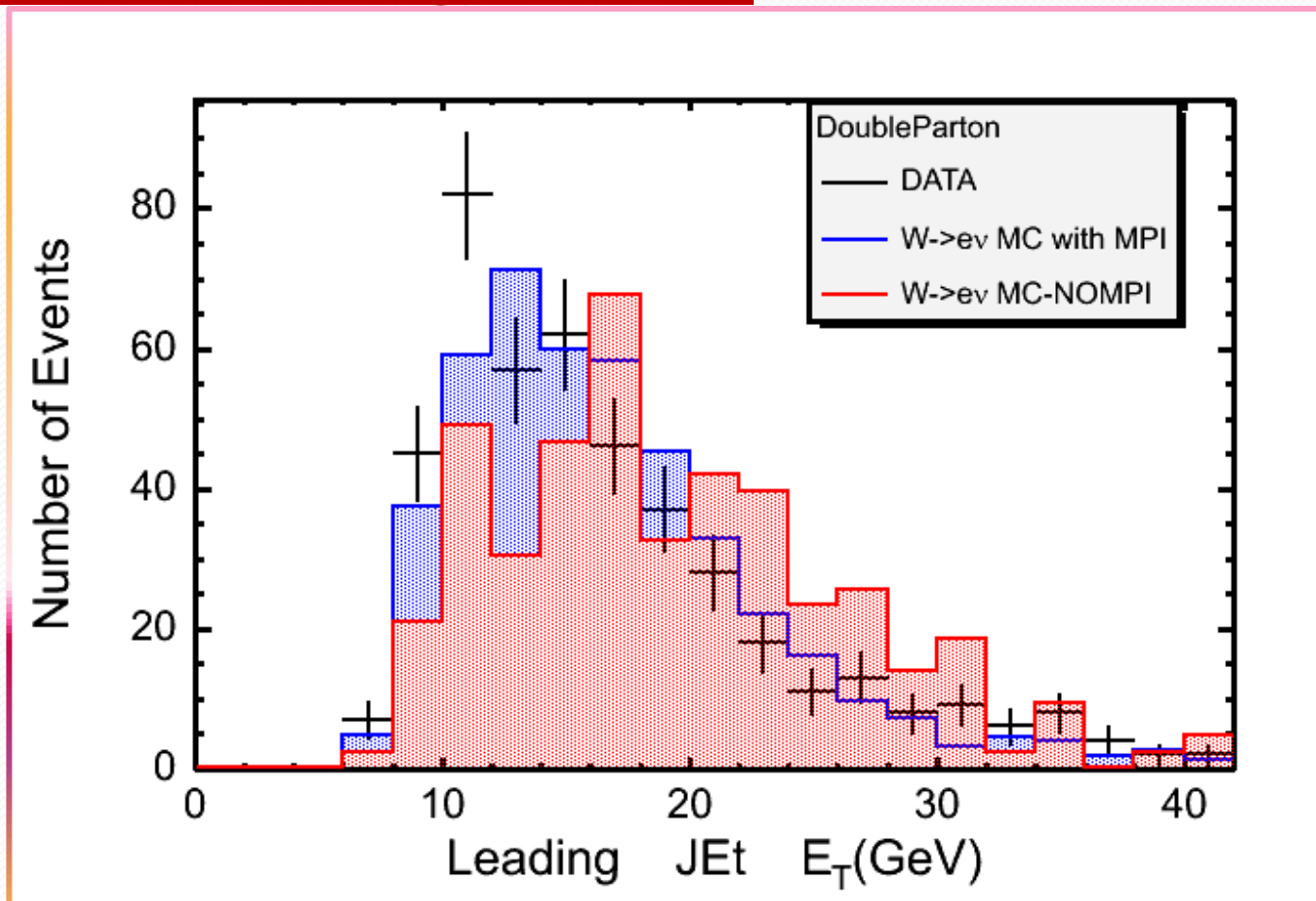
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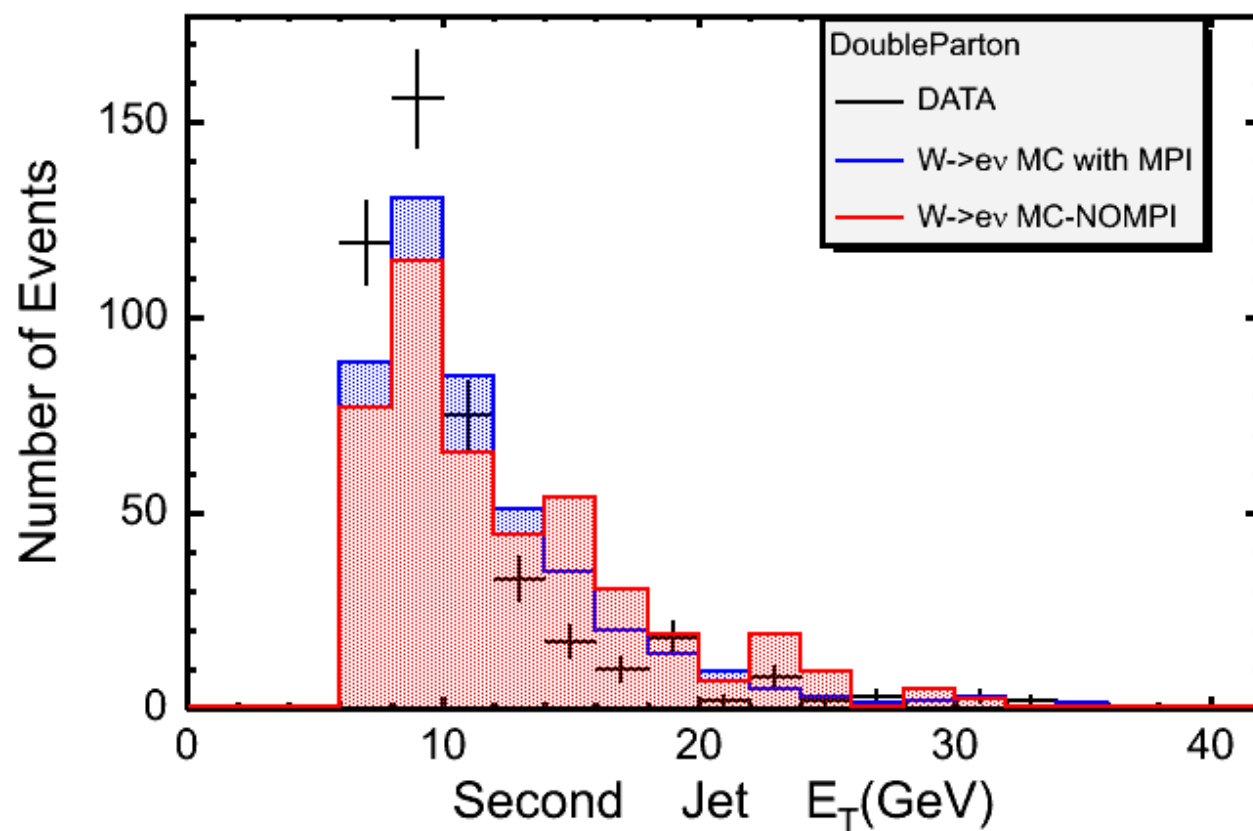
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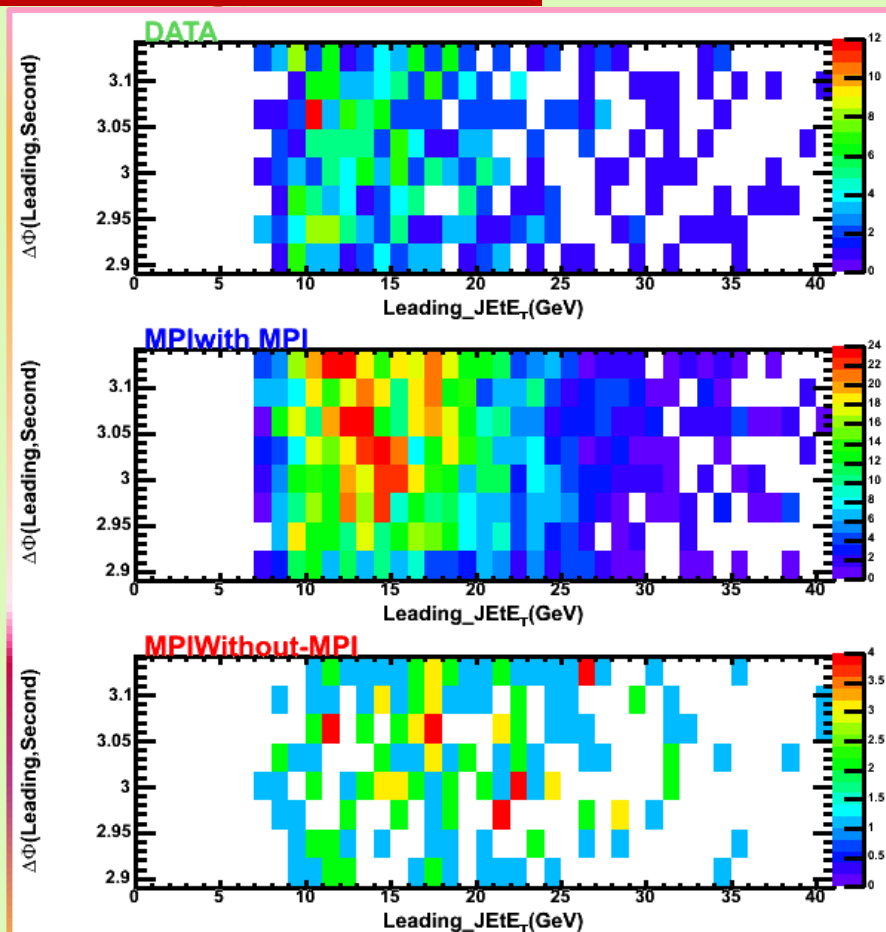
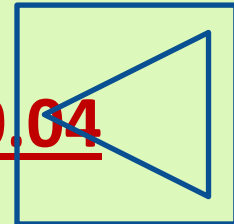
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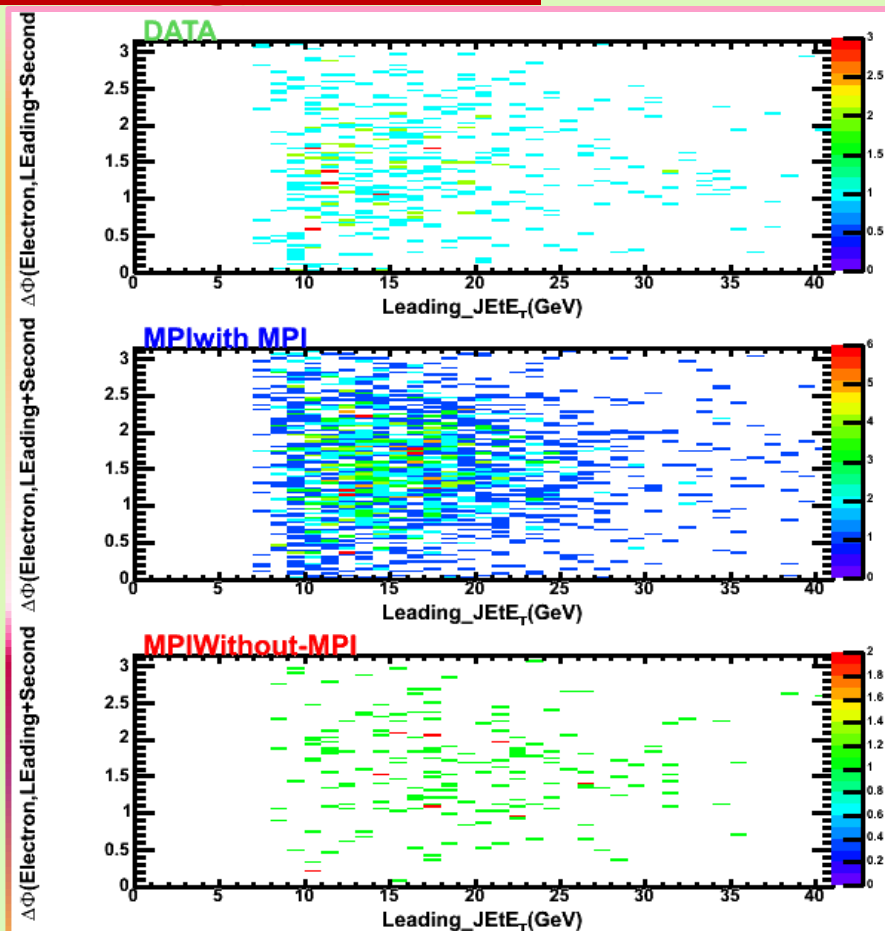
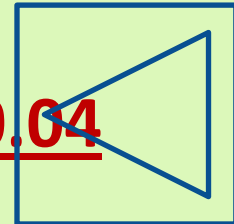
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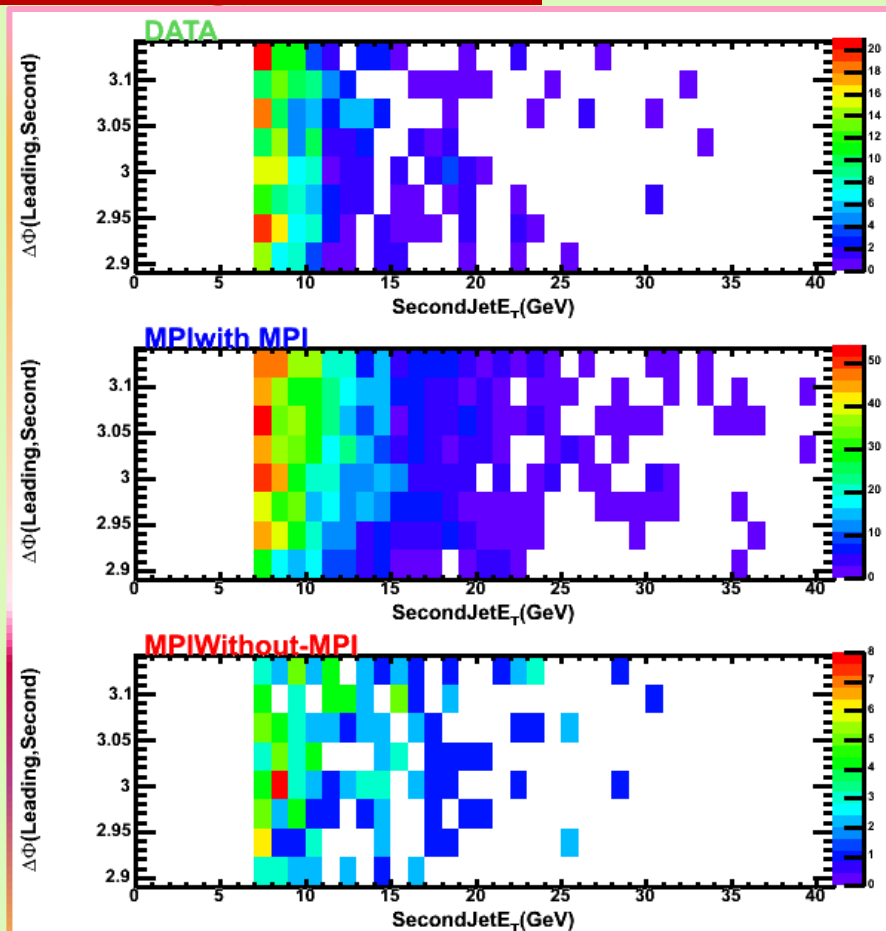
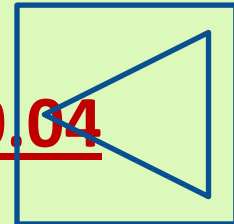
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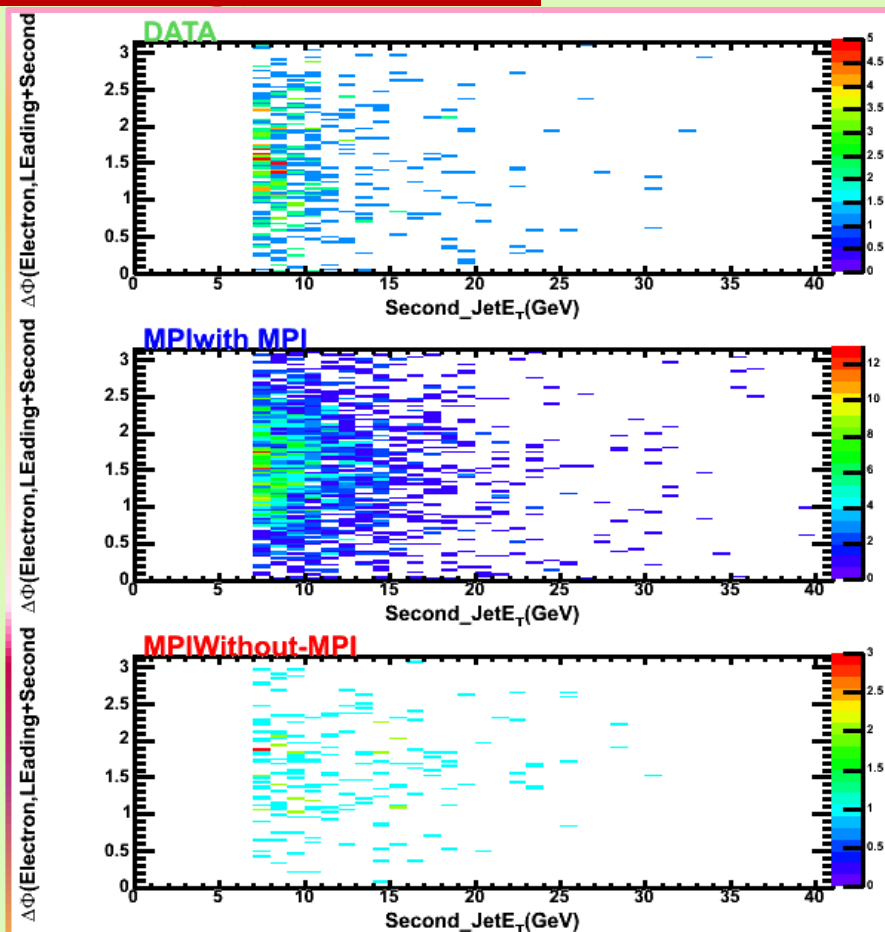
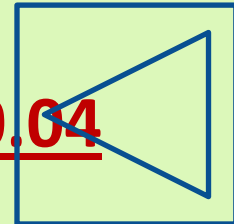
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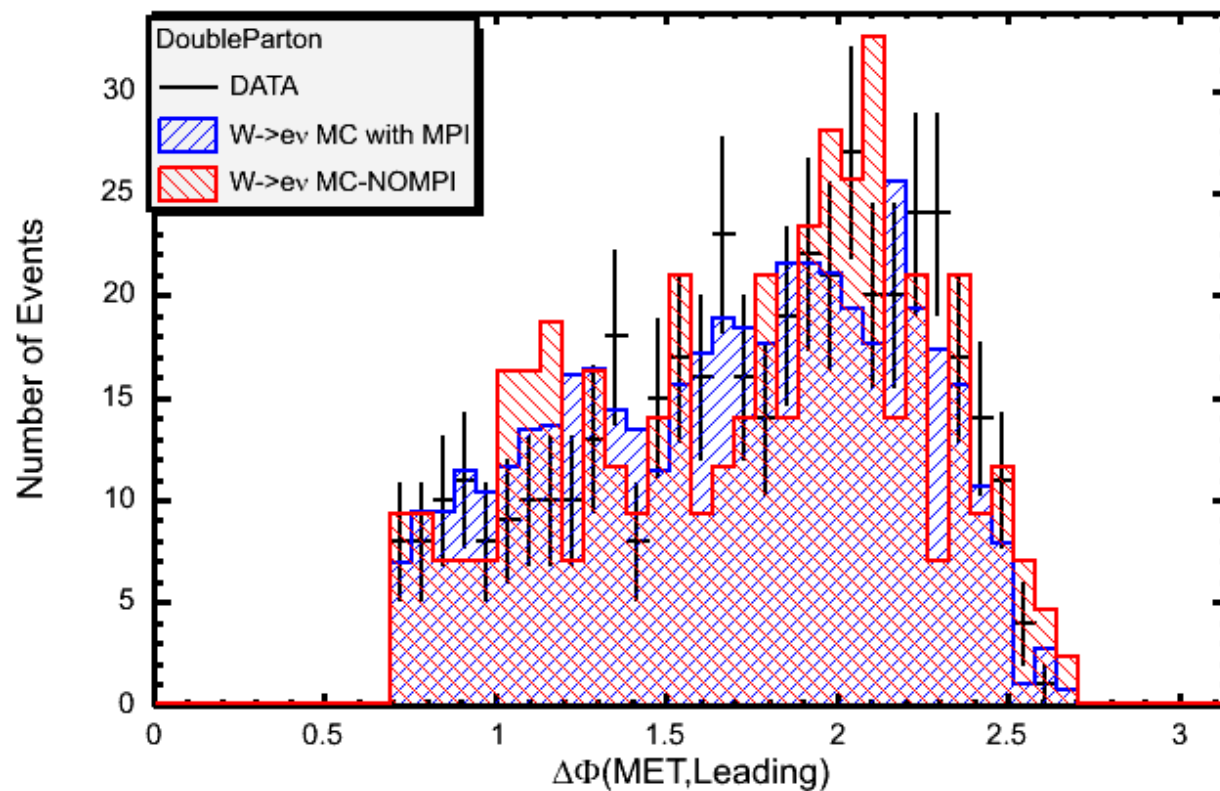
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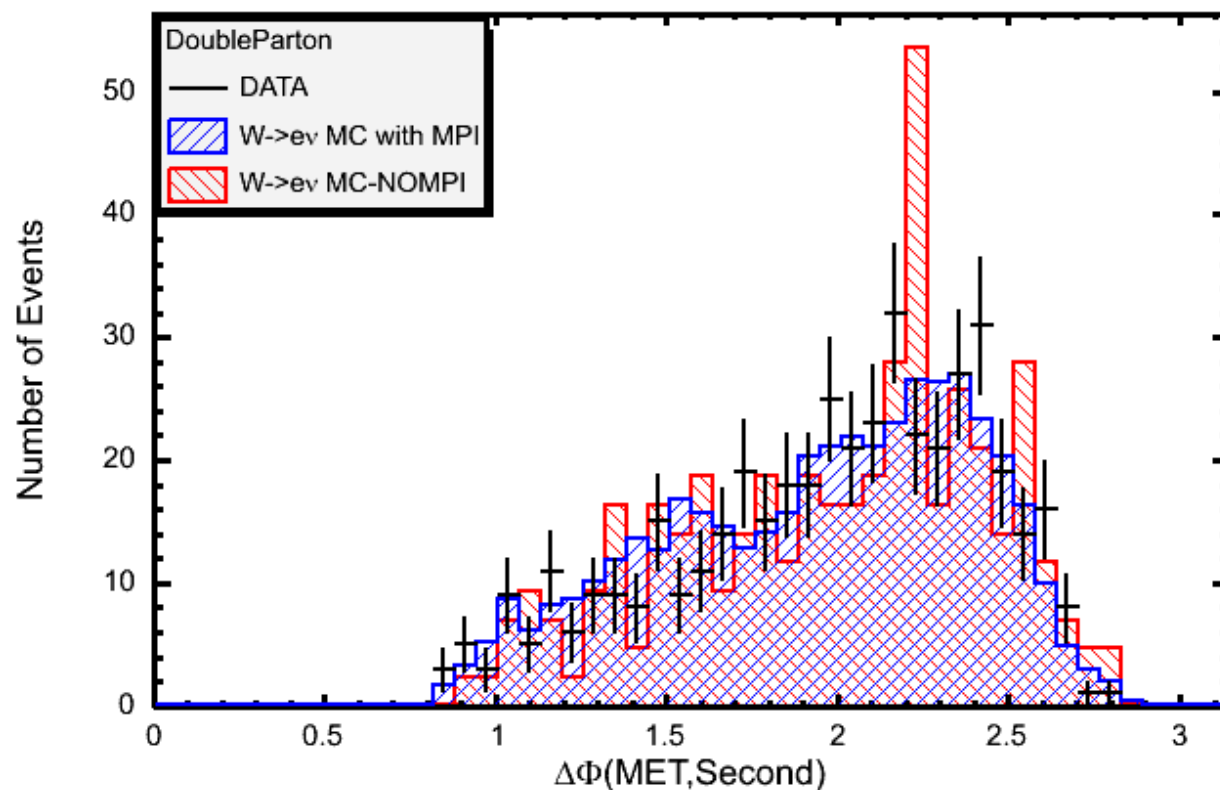
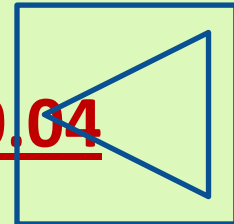
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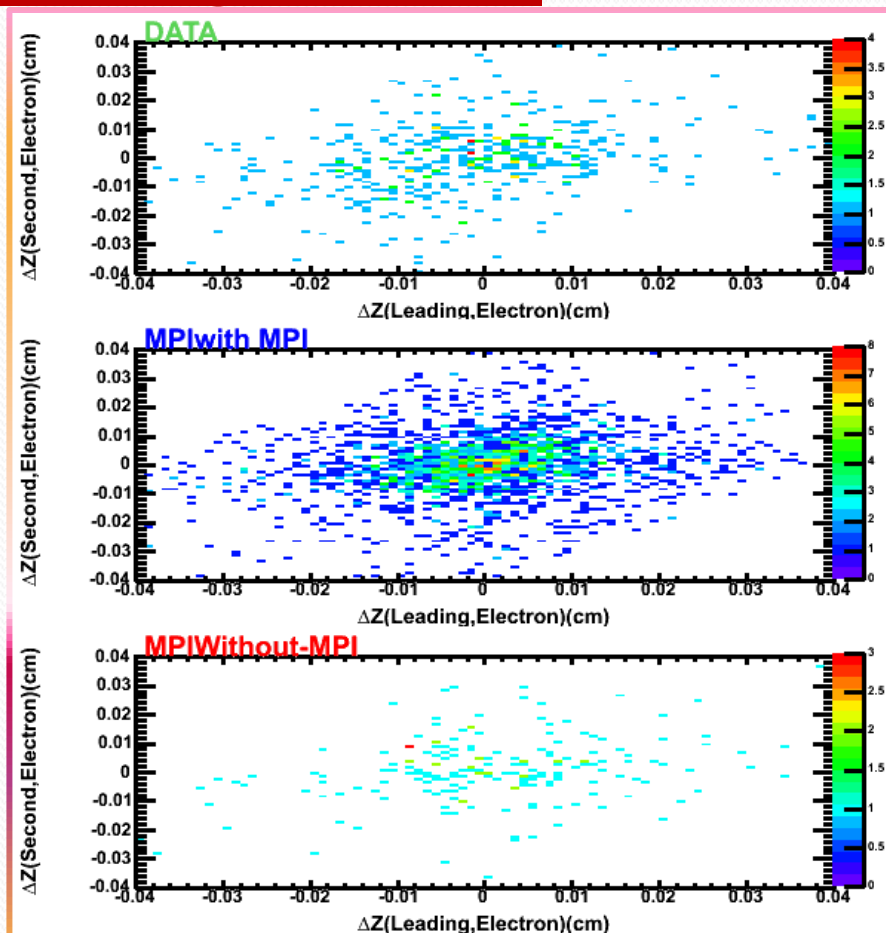
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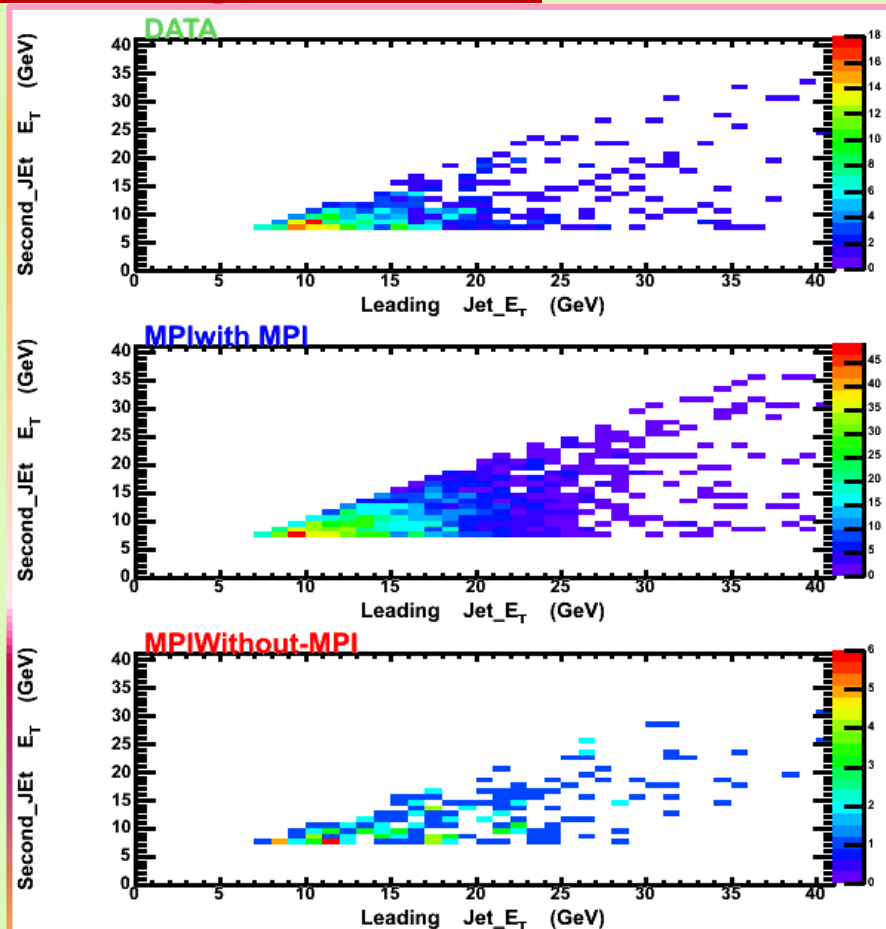
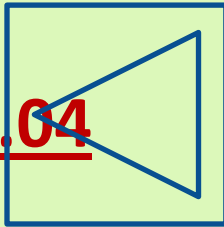
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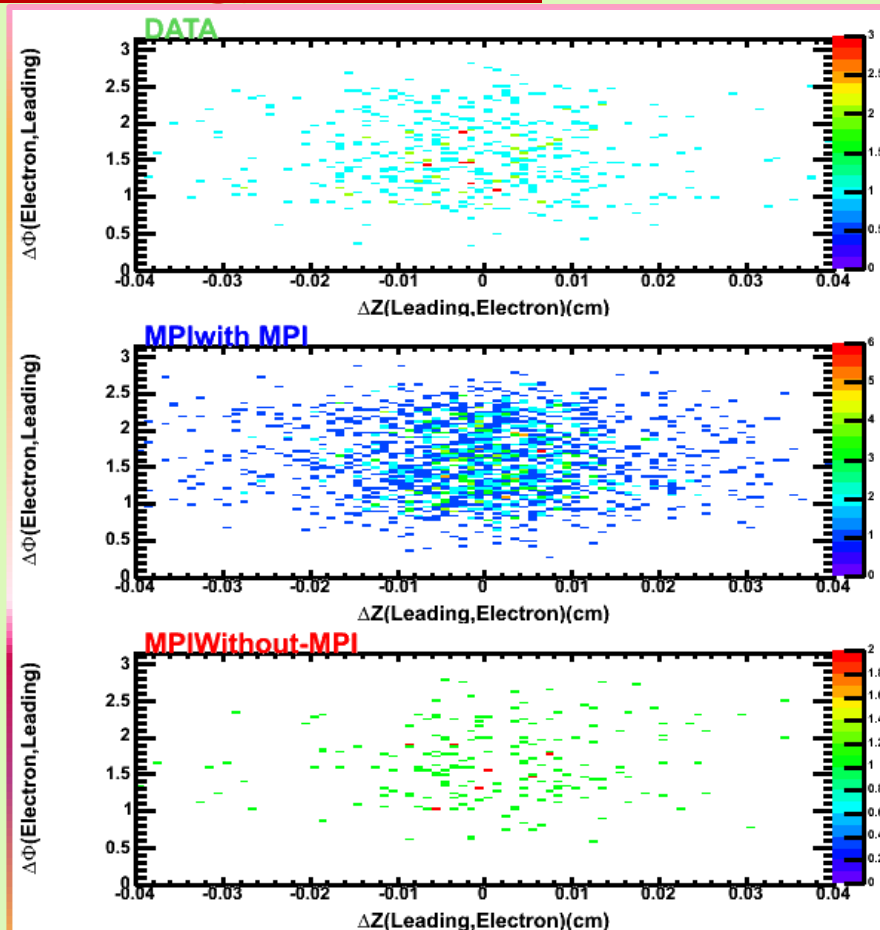
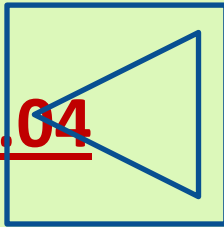
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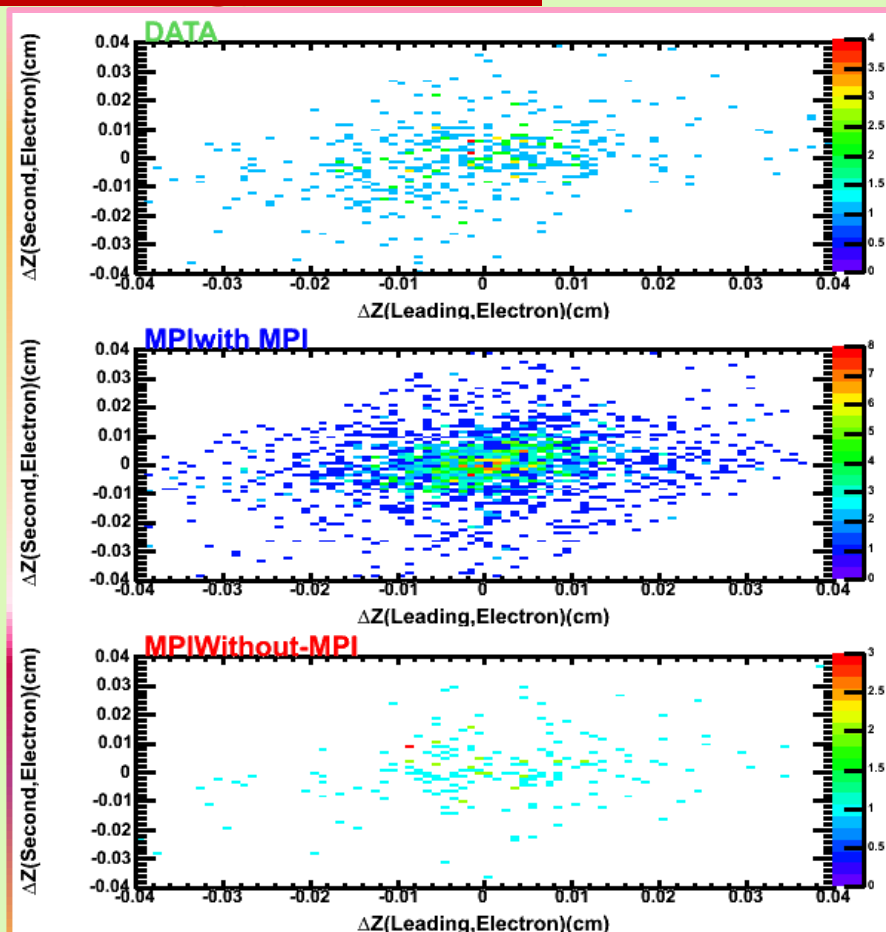
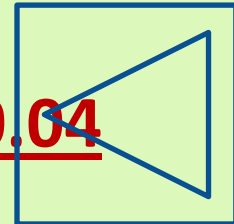
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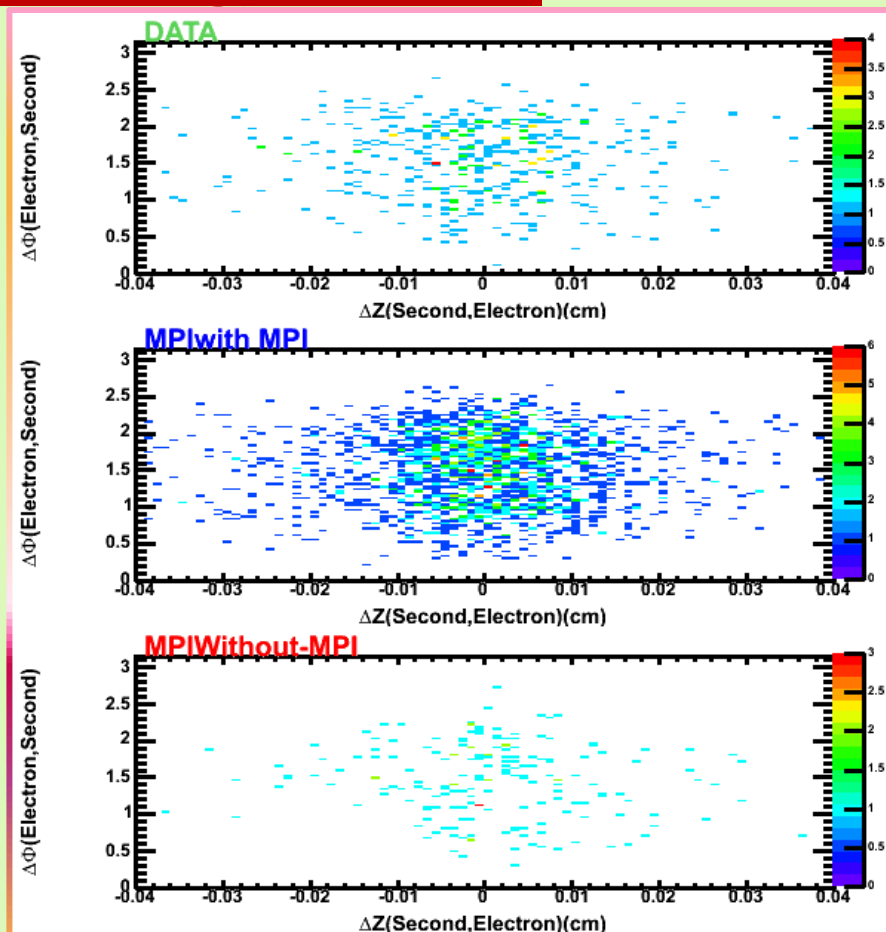
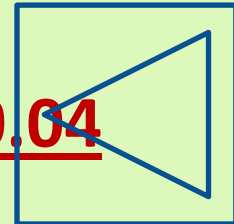
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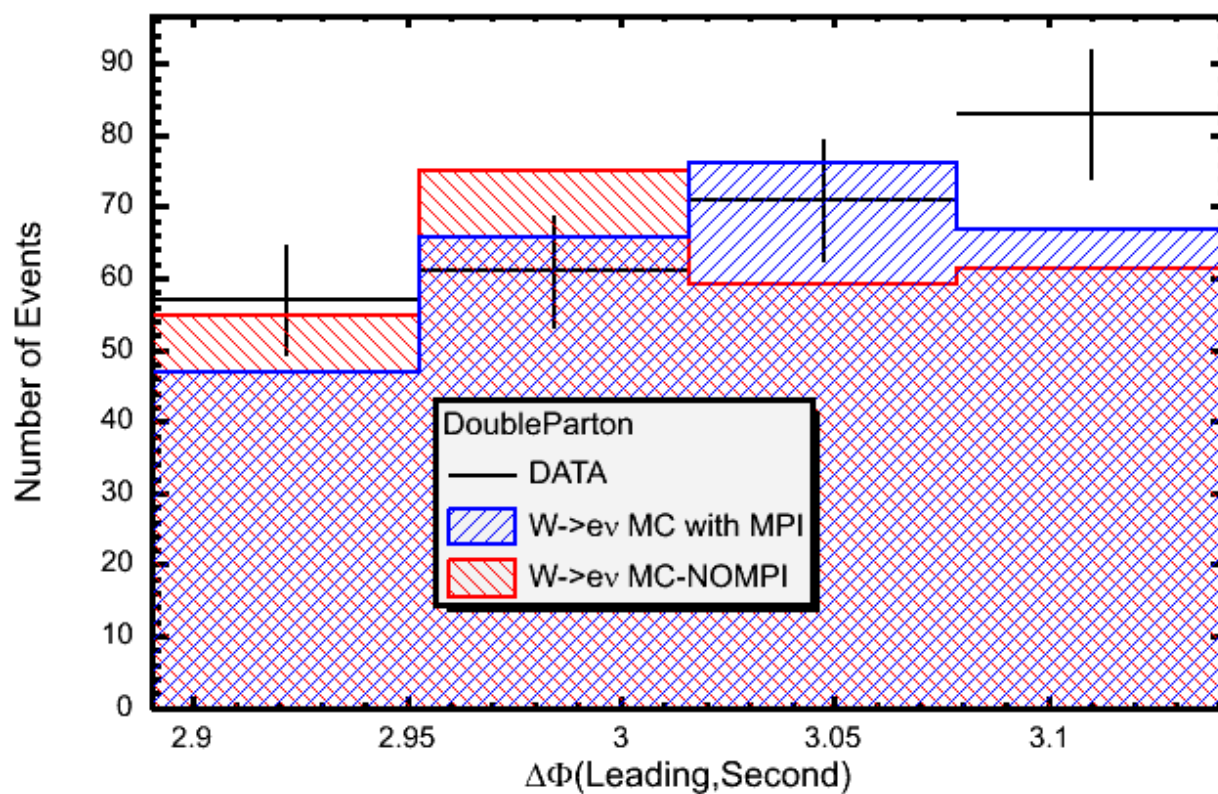
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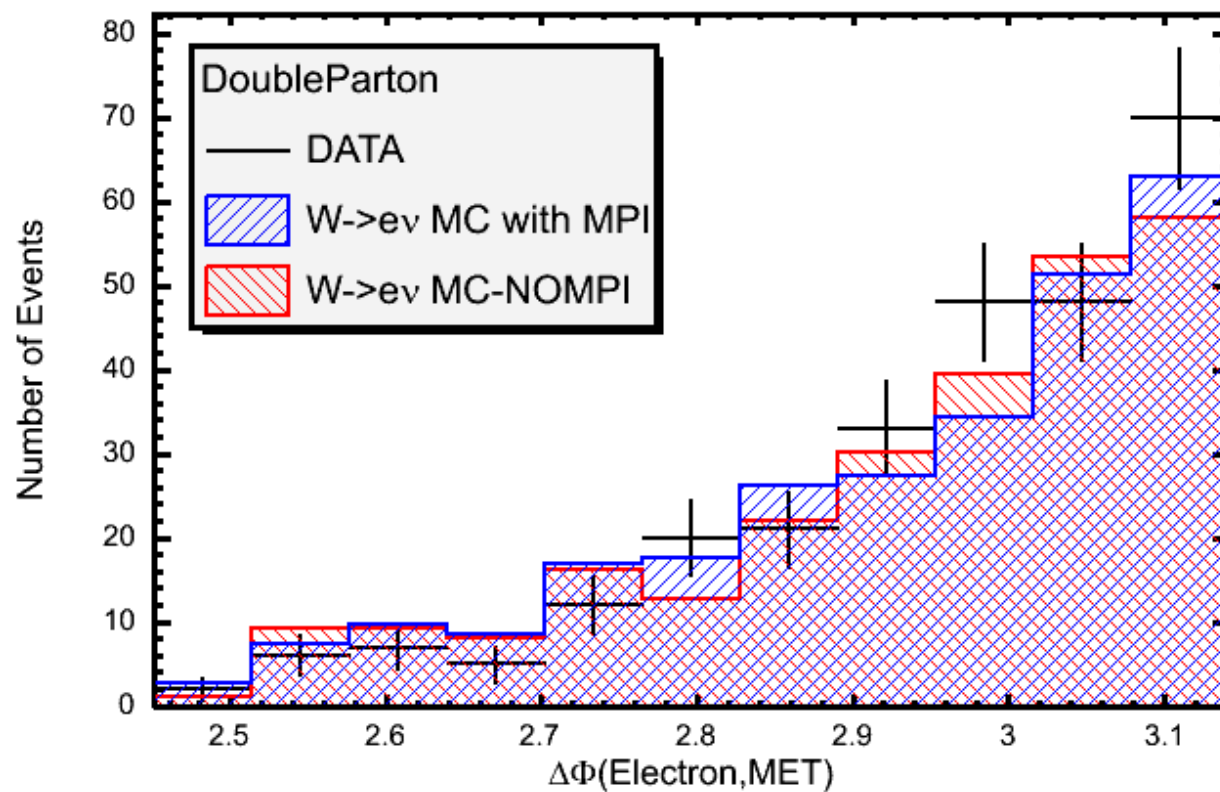
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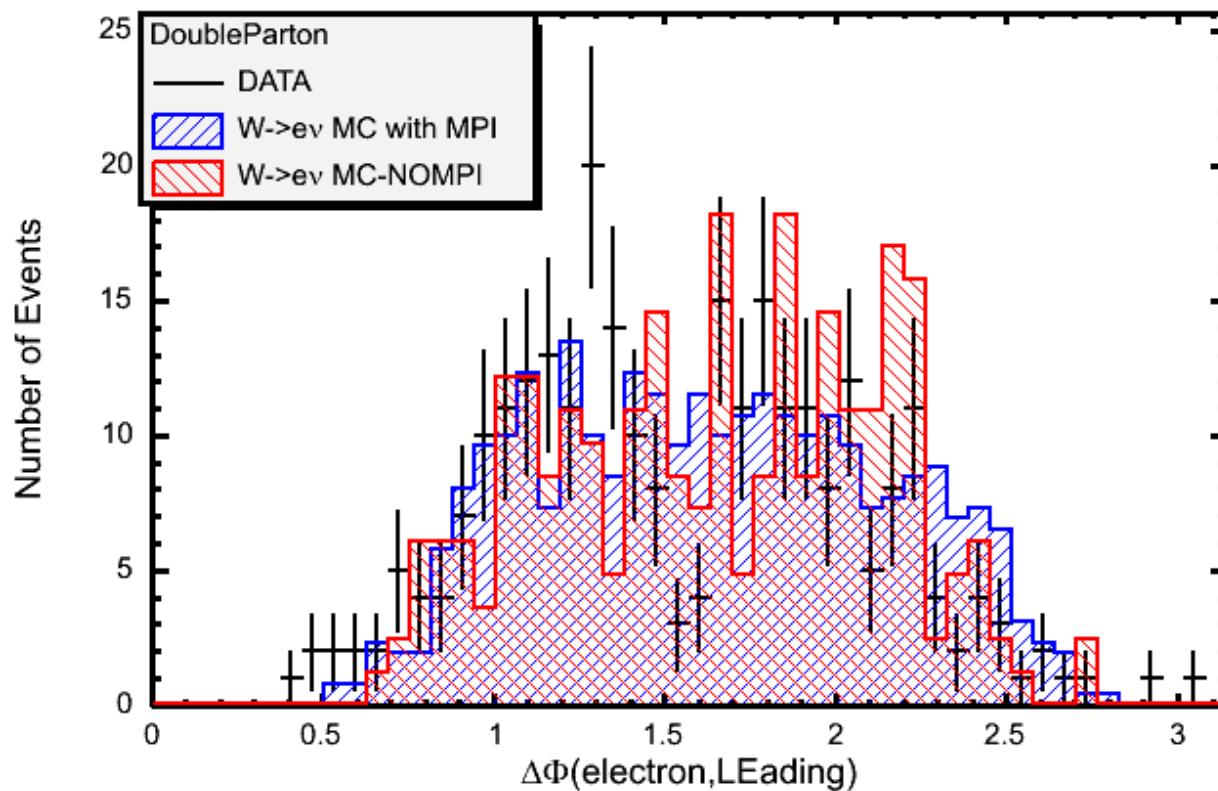
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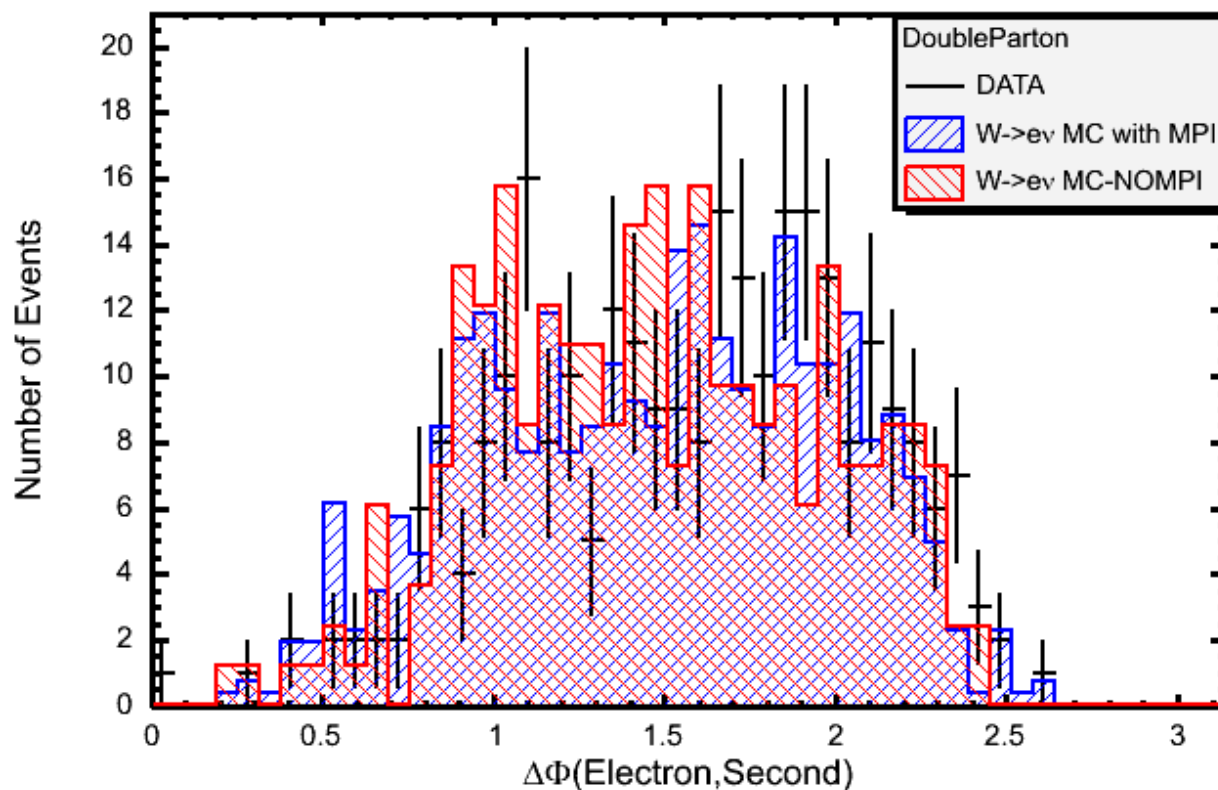
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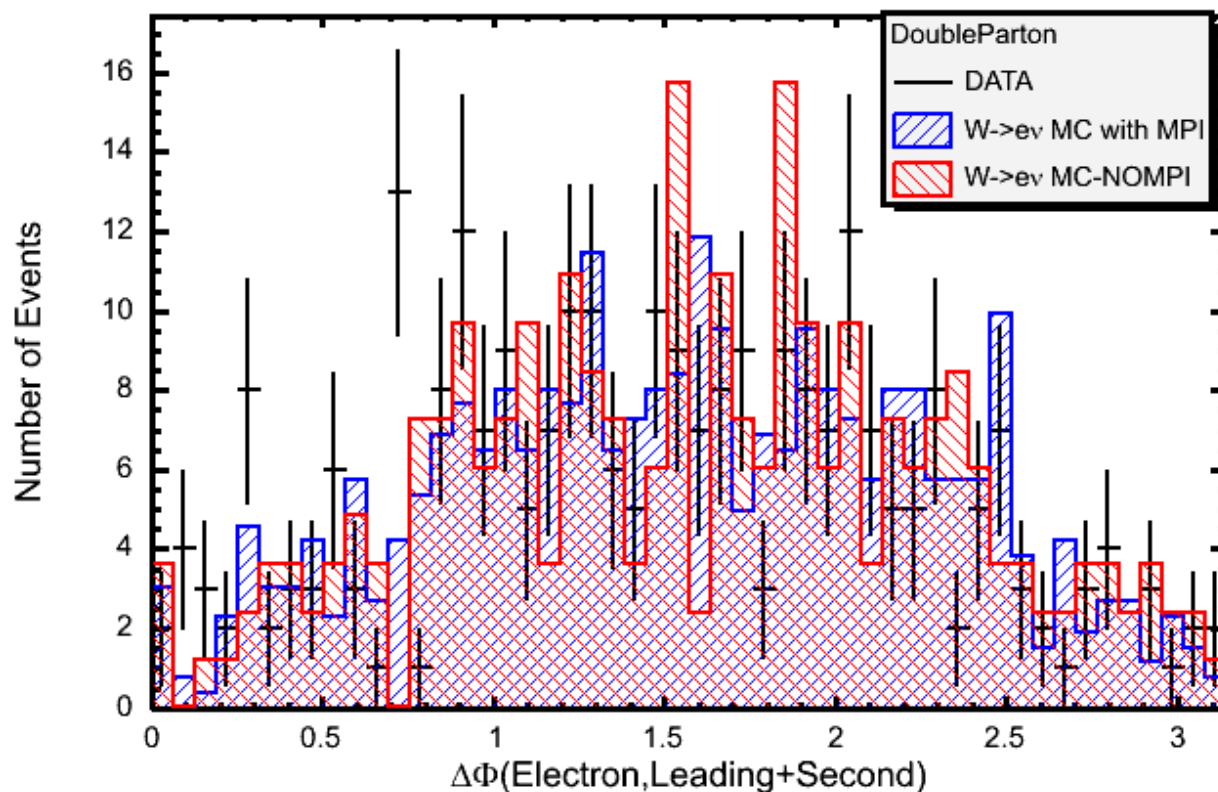
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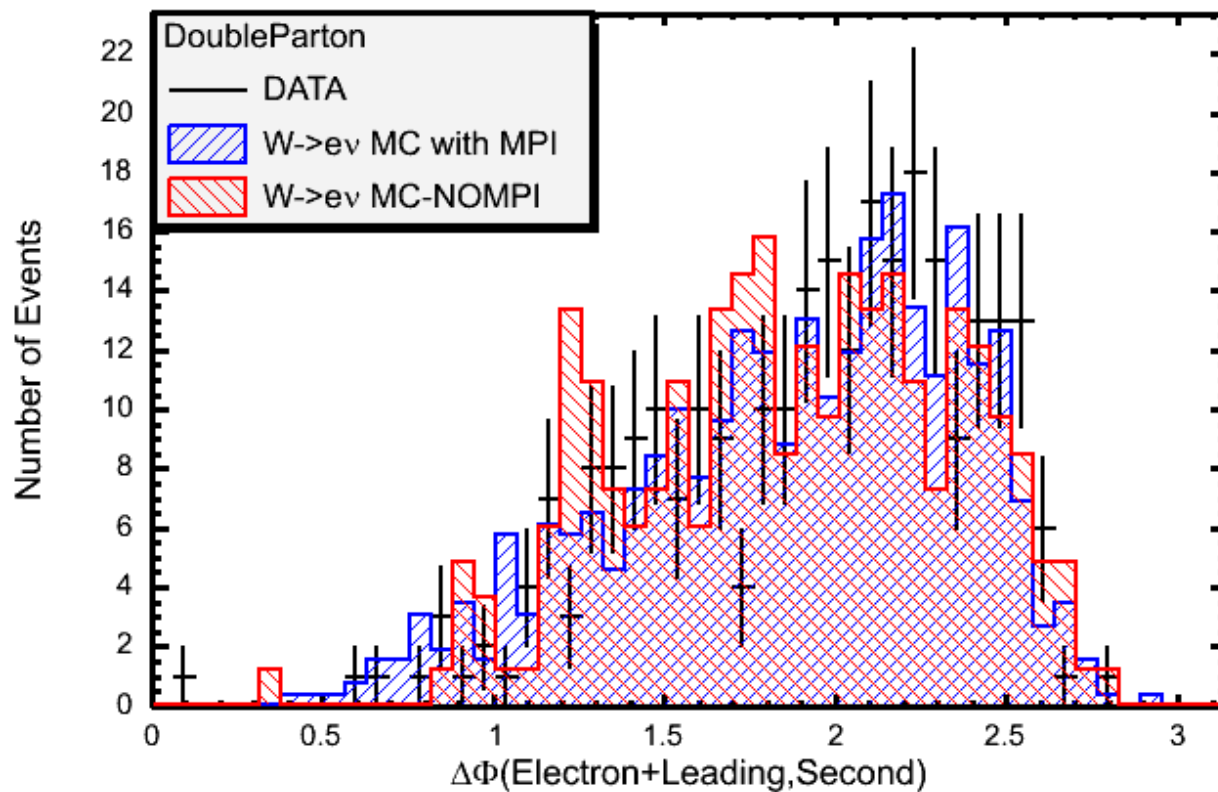
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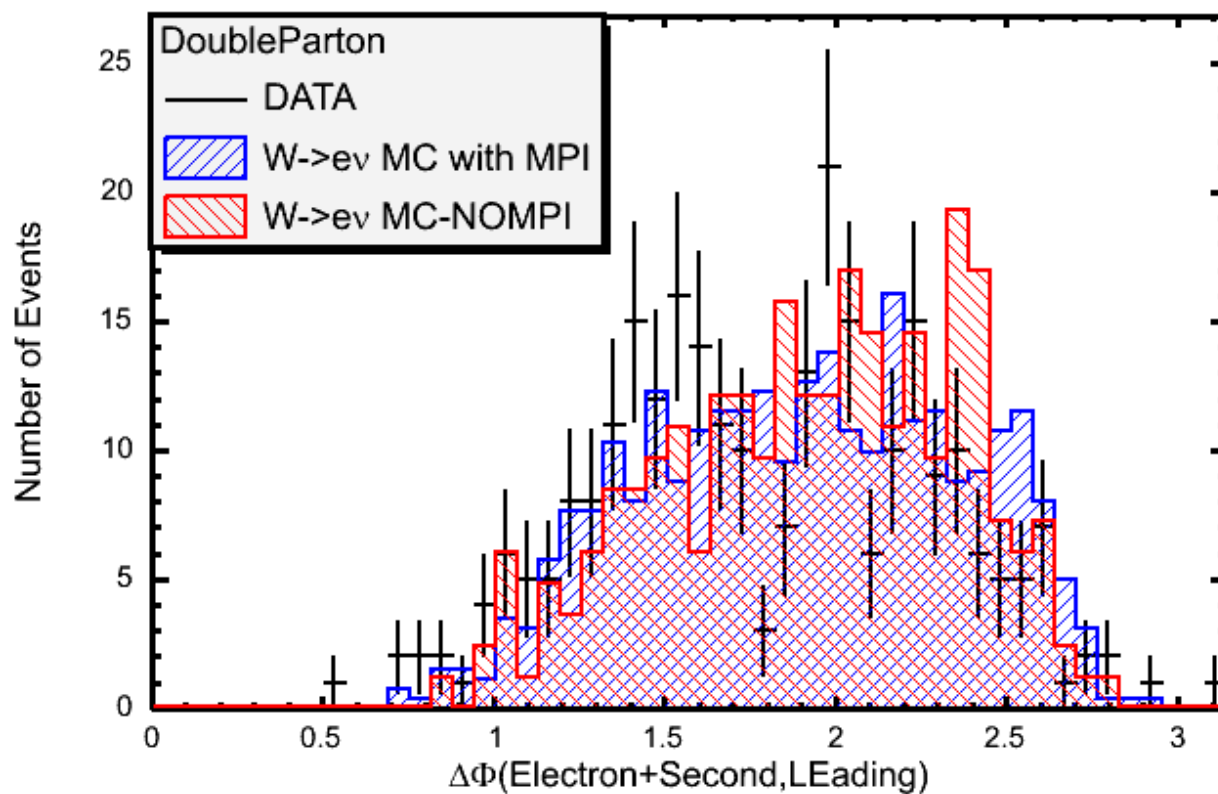
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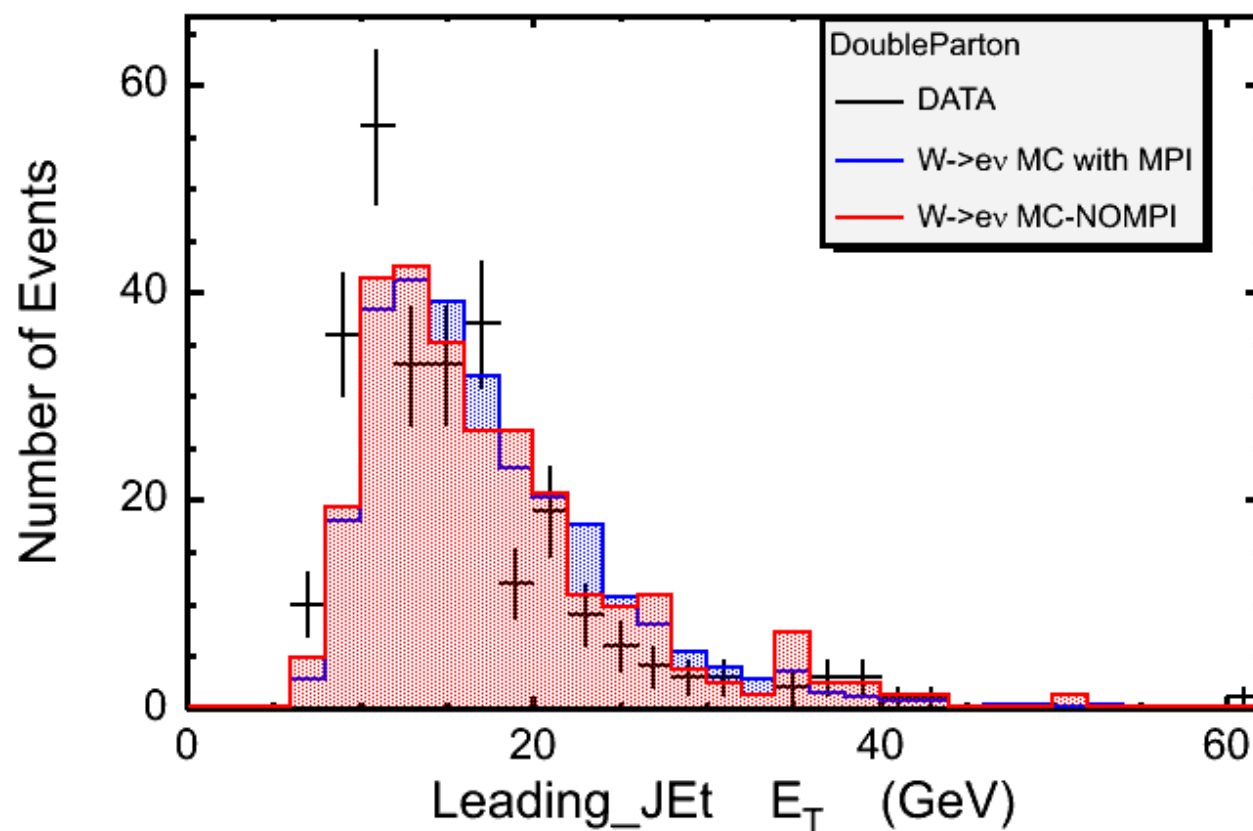
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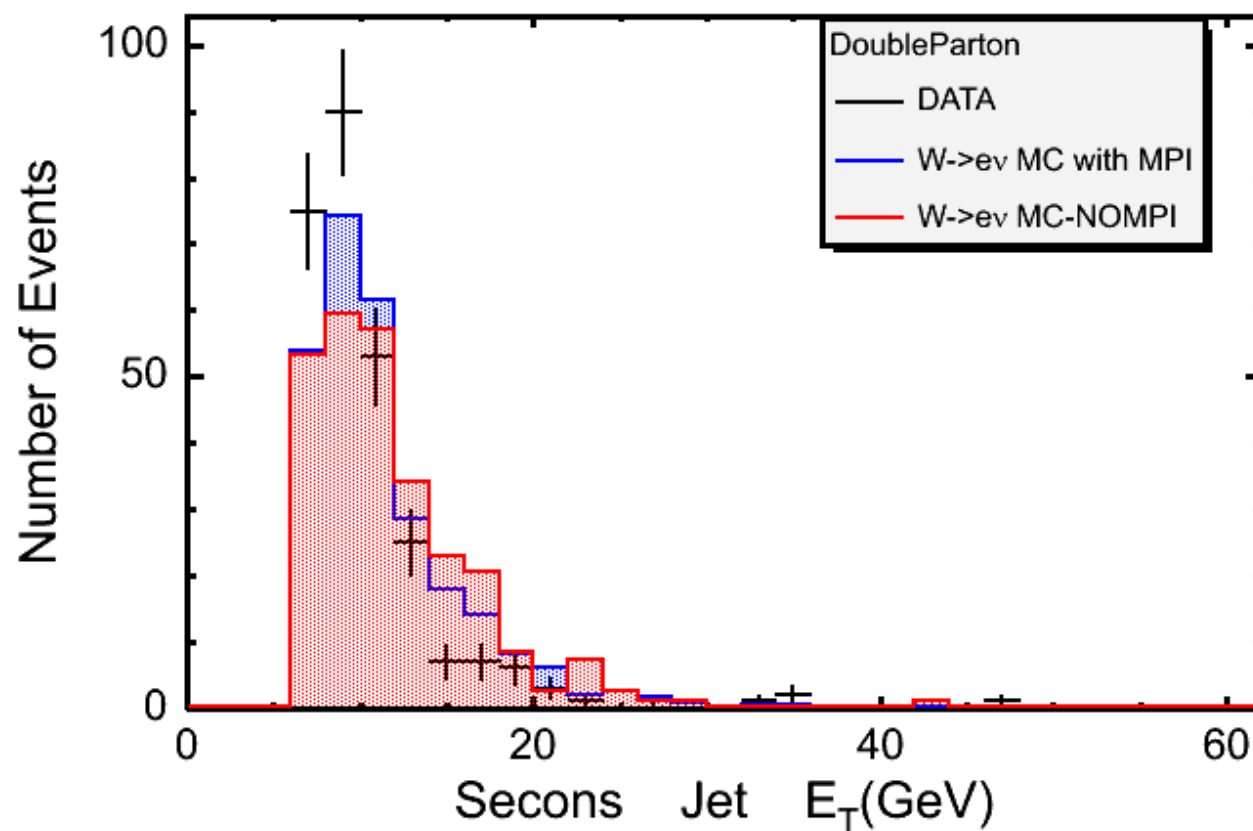
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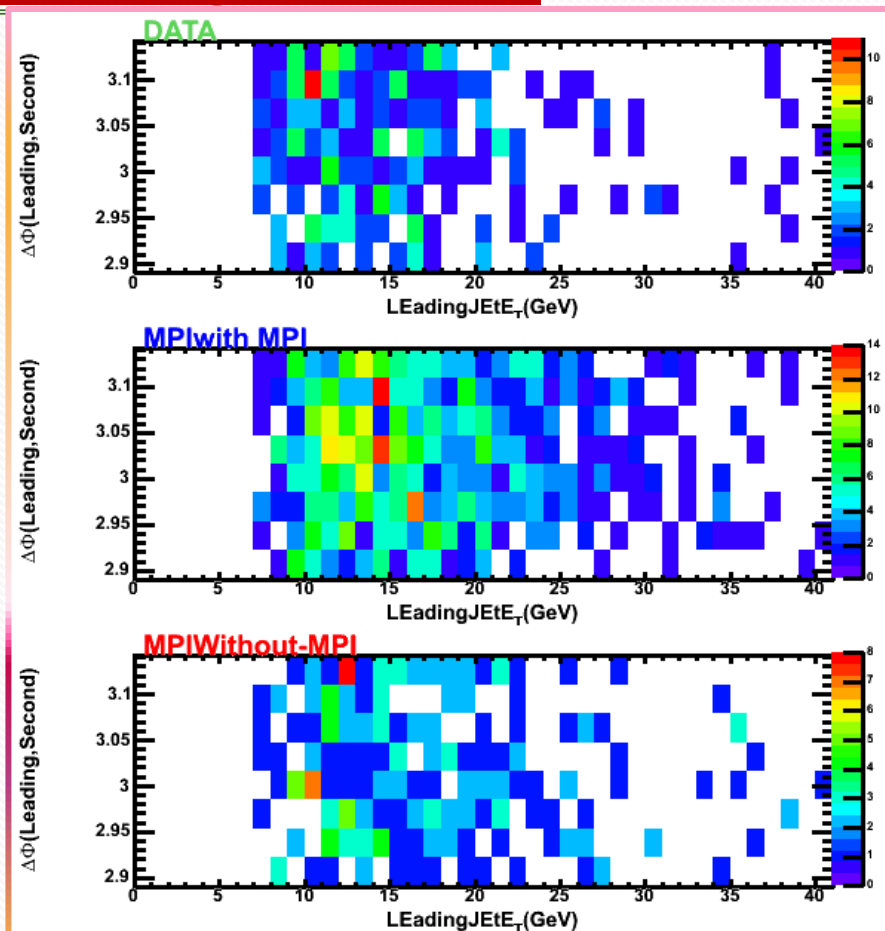
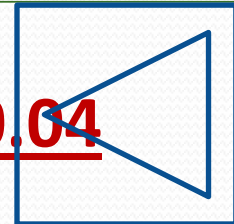
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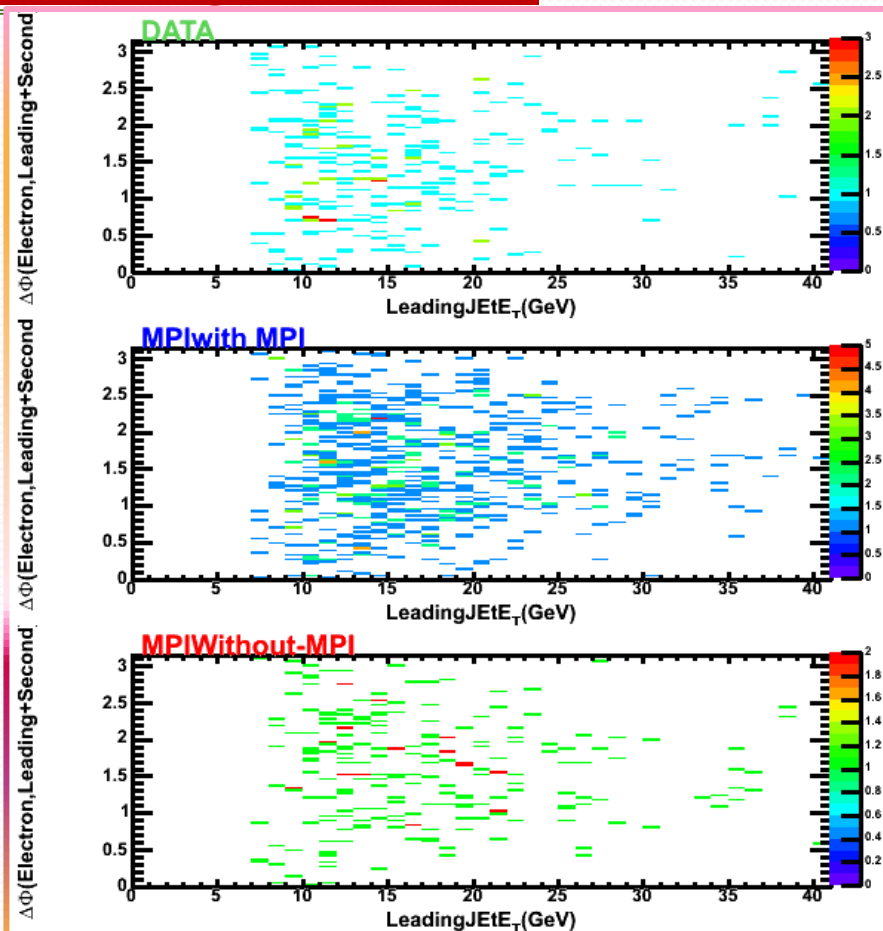
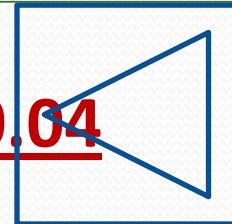
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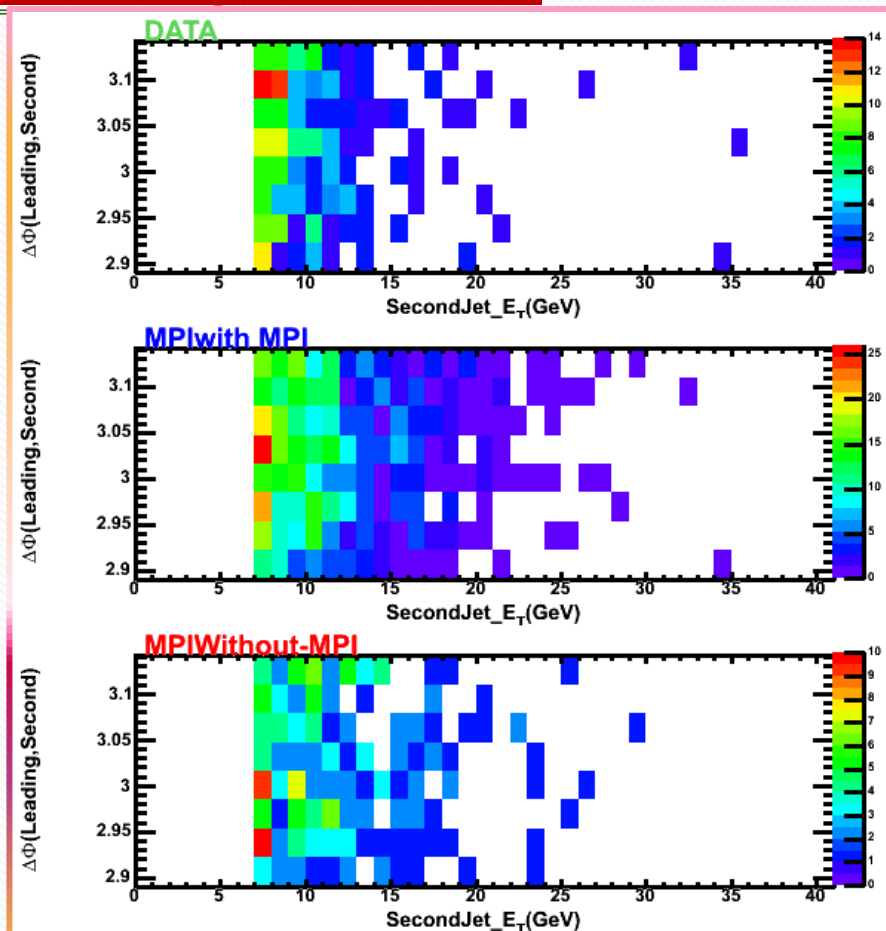
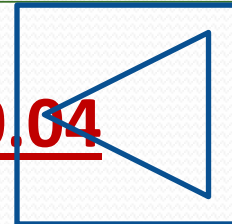
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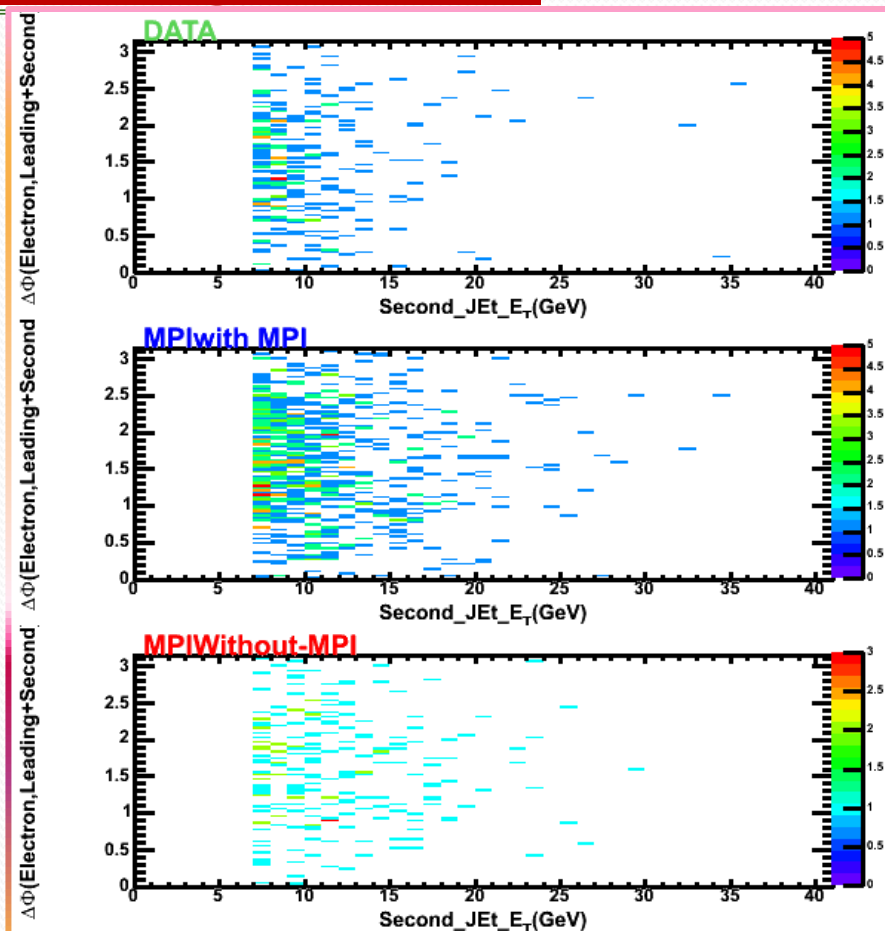
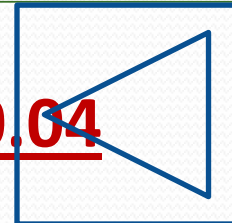
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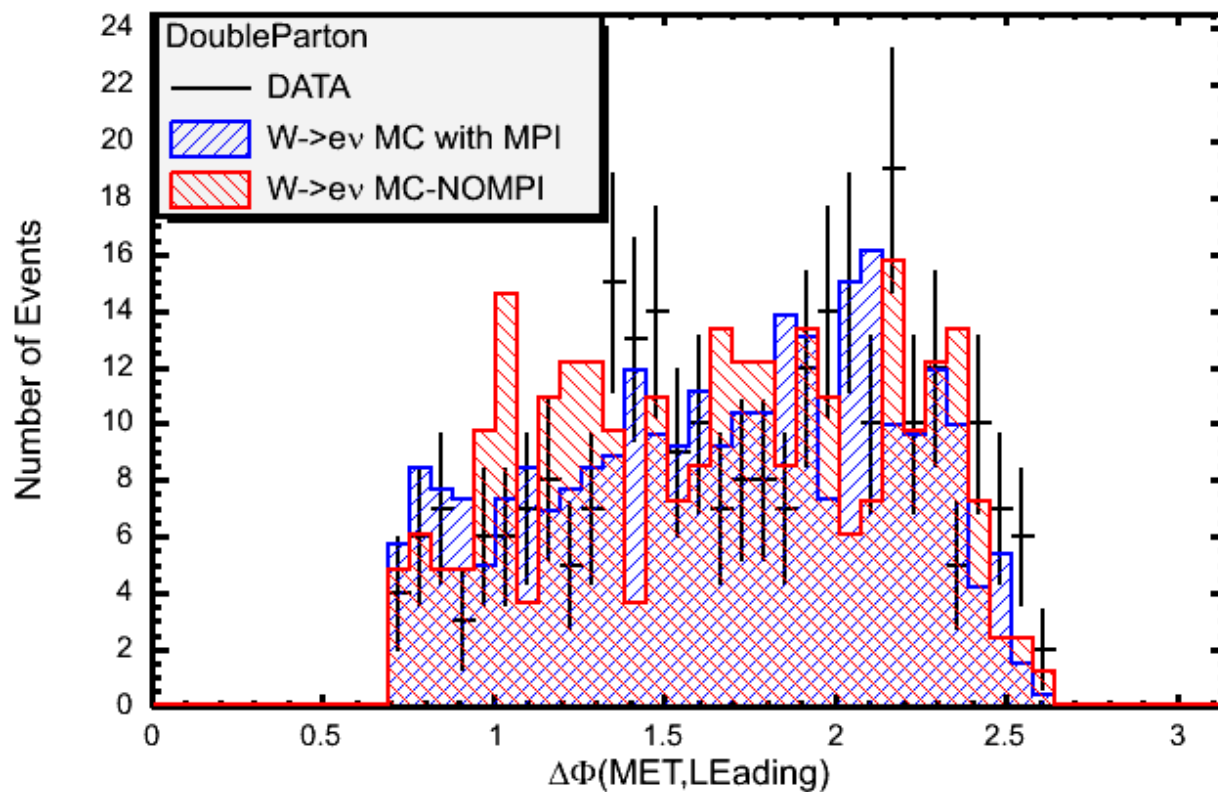
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 $\text{AND } \Delta Z(\text{Second}, \text{Leading}) < 0.04 \text{ cm}$



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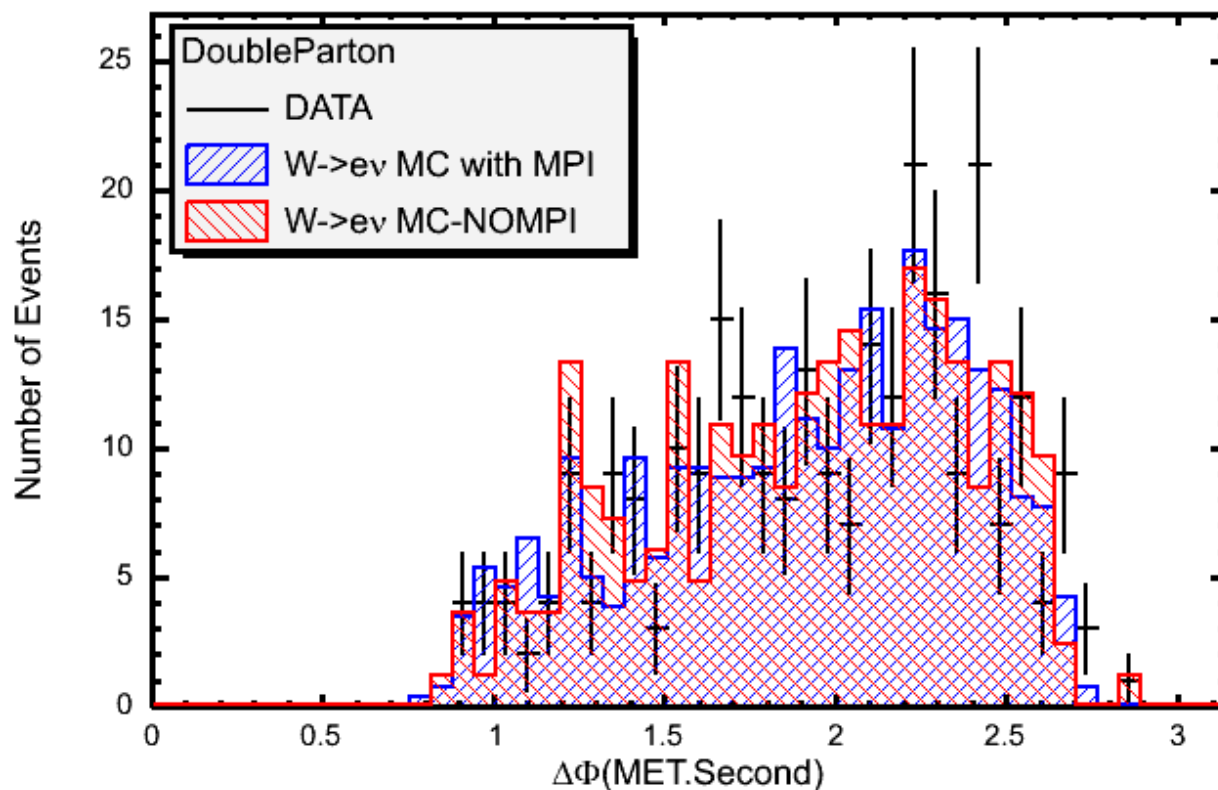
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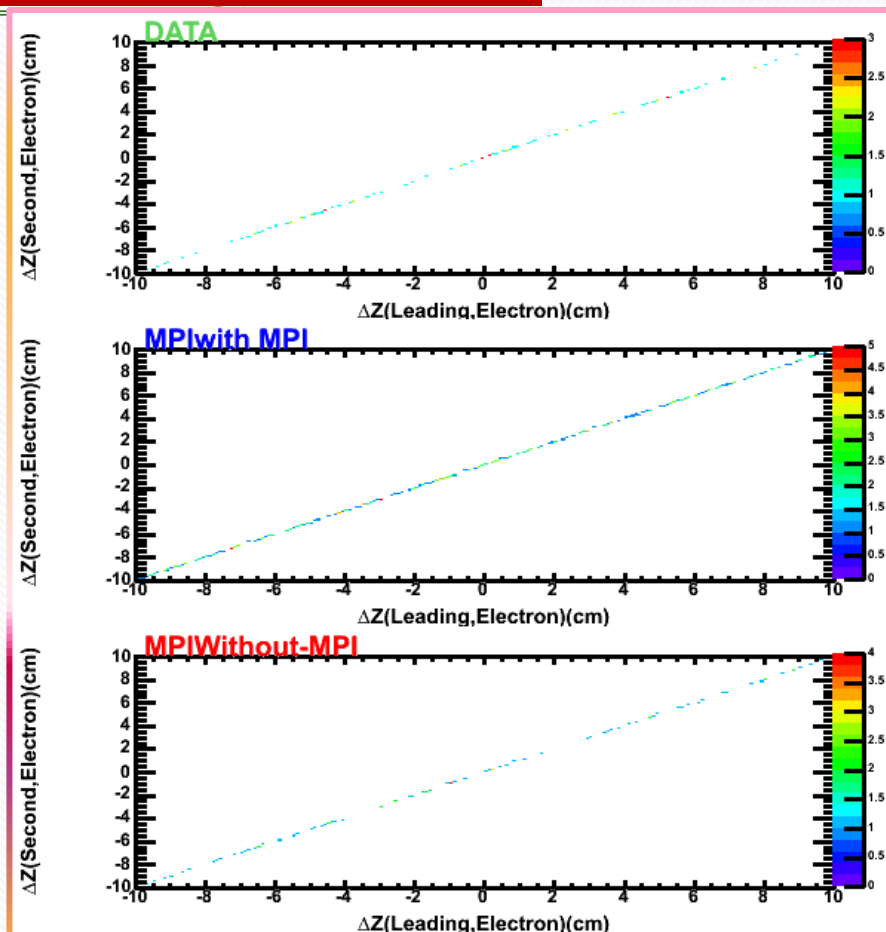
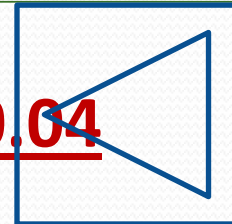
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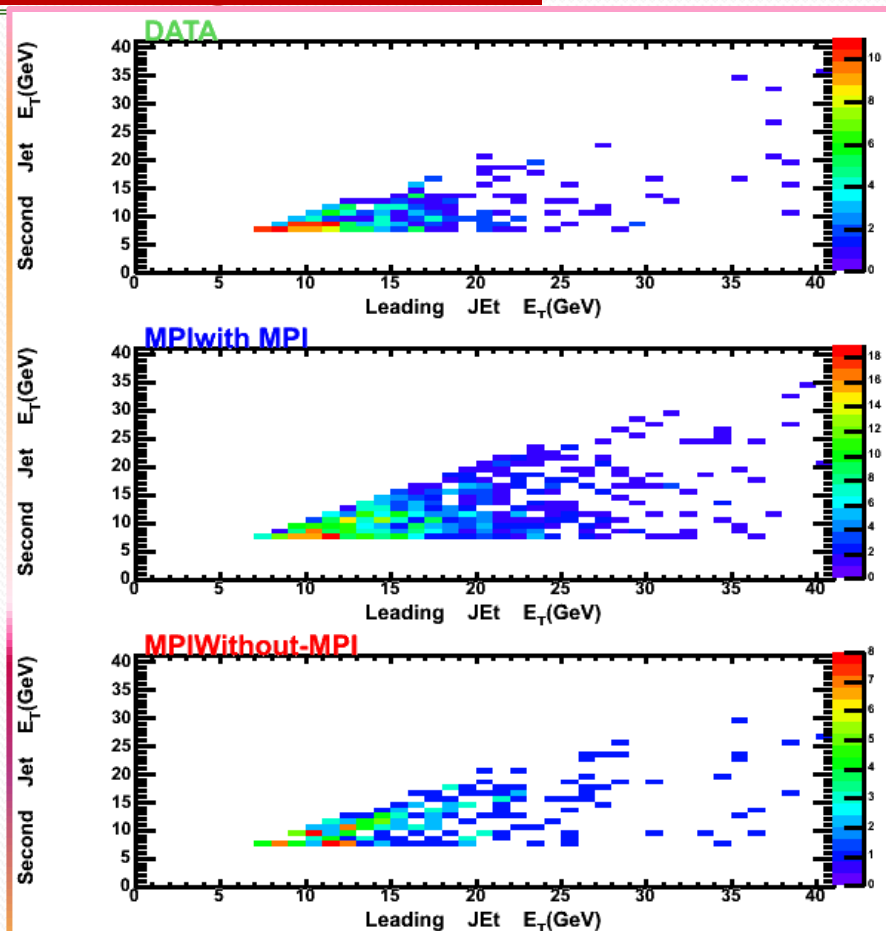
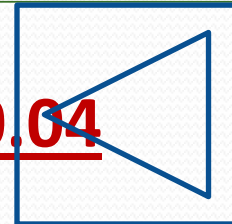
**$\Delta Z(\text{Electron}, \text{Leading}) > 0.04$ AND $\Delta Z(\text{Electron}, \text{Second}) > 0.04$
AND $\Delta Z(\text{Second}, \text{Leading}) < 0.04$ cm**



•DeltaZ

W+ONLY-TWOJETS/ $\Delta\phi(\text{Electron}, \text{MET}) > 2.5/$

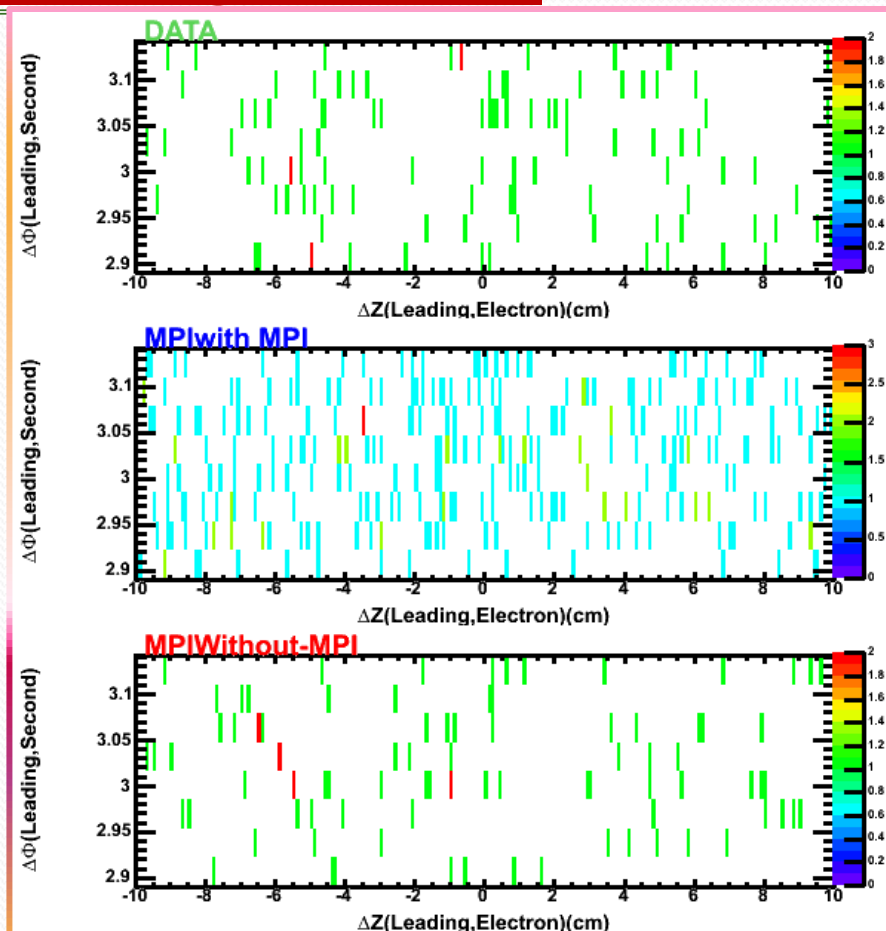
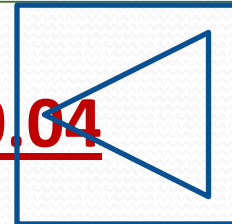
$\Delta Z(\text{Electron}, \text{Leading}) > 0.04$ AND $\Delta Z(\text{Electron}, \text{Second}) > 0.04$
 $\text{AND } \Delta Z(\text{Second}, \text{Leading}) < 0.04 \text{ cm}$



•DeltaZ

W+ONLY-TWOJETS/ $\Delta\phi(\text{Electron}, \text{MET}) > 2.5/$

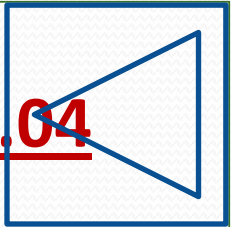
**$\Delta Z(\text{Electron}, \text{Leading}) > 0.04$ AND $\Delta Z(\text{Electron}, \text{Second}) > 0.04$
AND $\Delta Z(\text{Second}, \text{Leading}) < 0.04$ cm**



•DeltaZ

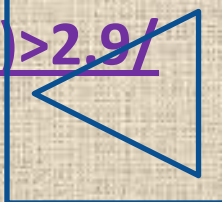
W+ONLY-TWOJETS / $\Delta\phi(\text{Electron}, \text{MET}) > 2.5$ /

$\Delta Z(\text{Electron}, \text{Leading}) > 0.04$ AND $\Delta Z(\text{Electron}, \text{Second}) > 0.04$
AND $\Delta Z(\text{Second}, \text{Leading}) < 0.04$ cm



•DeltaZ

W+ONLY-TWOJETS/ $\Delta\phi(\text{Electron}, \text{MET}) > 2.5$ / $\Delta\phi(\text{Leading}, \text{Second}) > 2.9$ /
 $\Delta Z(\text{Electron}, \text{Leading}) > 0.04$ AND $\Delta Z(\text{Electron}, \text{Second}) > 0.04$ AND
 $\Delta Z(\text{Second}, \text{Leading}) < 0.04$ cm



•DeltaZ

W+ONLY-TWOJETS/ $\Delta\phi(\text{Electron}, \text{MET}) > 2.5$ / $\Delta\phi(\text{Leading}, \text{Second}) > 2.9$ /
 $\Delta Z(\text{Electron}, \text{Leading}) > 0.04$ AND $\Delta Z(\text{Electron}, \text{Second}) > 0.04$ AND
 $\Delta Z(\text{Second}, \text{Leading}) < 0.04$ cm



•DeltaZ

W+ONLY-TWOJETS/ $\Delta\phi(\text{Electron}, \text{MET}) > 2.5$ / $\Delta\phi(\text{Leading}, \text{Second}) > 2.9$ /
 $\Delta Z(\text{Electron}, \text{Leading}) > 0.04$ AND $\Delta Z(\text{Electron}, \text{Second}) > 0.04$ AND
 $\Delta Z(\text{Second}, \text{Leading}) < 0.04$ cm



•DeltaZ

W+ONLY-TWOJETS/ $\Delta\phi(\text{Electron},\text{MET})>2.5/ \Delta\phi(\text{Leading},\text{Second})>2.9/$
 $\Delta Z(\text{Electron},\text{Leading})>0.04$ AND $\Delta Z(\text{Electron},\text{Second})>0.04$ AND
 $\Delta Z(\text{Second},\text{Leading})<0.04$ cm



•DeltaZ

W+ONLY-TWOJETS/ $\Delta\phi(\text{Electron},\text{MET})>2.5/ \Delta\phi(\text{Leading},\text{Second})>2.9/$
 $\Delta Z(\text{Electron},\text{Leading})>0.04$ AND $\Delta Z(\text{Electron},\text{Second})>0.04$ AND
 $\Delta Z(\text{Second},\text{Leading})<0.04$ cm



•DeltaZ

W+ONLY-TWOJETS/ $\Delta\phi(\text{Electron},\text{MET})>2.5/ \Delta\phi(\text{Leading},\text{Second})>2.9/$
 $\Delta Z(\text{Electron},\text{Leading})>0.04$ AND $\Delta Z(\text{Electron},\text{Second})>0.04$ AND
 $\Delta Z(\text{Second},\text{Leading})<0.04$ cm



•DeltaZ

W+ONLY-TWOJETS/ $\Delta\phi(\text{Electron}, \text{MET}) > 2.5$ / $\Delta\phi(\text{Leading}, \text{Second}) > 2.9$ /
 $\Delta Z(\text{Electron}, \text{Leading}) > 0.04$ AND $\Delta Z(\text{Electron}, \text{Second}) > 0.04$ AND
 $\Delta Z(\text{Second}, \text{Leading}) < 0.04$ cm



•DeltaZ

W+ONLY-TWOJETS/ $\Delta\phi(\text{Electron}, \text{MET}) > 2.5$ / $\Delta\phi(\text{Leading}, \text{Second}) > 2.9$ /
 $\Delta Z(\text{Electron}, \text{Leading}) > 0.04$ AND $\Delta Z(\text{Electron}, \text{Second}) > 0.04$ AND
 $\Delta Z(\text{Second}, \text{Leading}) < 0.04$ cm



•DeltaZ

W+ONLY-TWOJETS/ $\Delta\phi(\text{Electron}, \text{MET}) > 2.5$ / $\Delta\phi(\text{Leading}, \text{Second}) > 2.9$ /
 $\Delta Z(\text{Electron}, \text{Leading}) > 0.04$ AND $\Delta Z(\text{Electron}, \text{Second}) > 0.04$ AND
 $\Delta Z(\text{Second}, \text{Leading}) < 0.04$ cm



•DeltaZ

W+ONLY-TWOJETS/ $\Delta\phi(\text{Electron},\text{MET})>2.5/ \Delta\phi(\text{Leading},\text{Second})>2.9/$
 $\Delta Z(\text{Electron},\text{Leading})>0.04$ AND $\Delta Z(\text{Electron},\text{Second})>0.04$ AND
 $\Delta Z(\text{Second},\text{Leading})<0.04$ cm



•DeltaZ

W+ONLY-TWOJETS/ $\Delta\phi(\text{Electron}, \text{MET}) > 2.5$ / $\Delta\phi(\text{Leading}, \text{Second}) > 2.9$ /
 $\Delta Z(\text{Electron}, \text{Leading}) > 0.04$ AND $\Delta Z(\text{Electron}, \text{Second}) > 0.04$ AND
 $\Delta Z(\text{Second}, \text{Leading}) < 0.04$ cm



•DeltaZ

W+ONLY-TWOJETS/ $\Delta\phi(\text{Electron},\text{MET})>2.5/ \Delta\phi(\text{Leading},\text{Second})>2.9/$
 $\Delta Z(\text{Electron},\text{Leading})>0.04$ AND $\Delta Z(\text{Electron},\text{Second})>0.04$ AND
 $\Delta Z(\text{Second},\text{Leading})<0.04$ cm



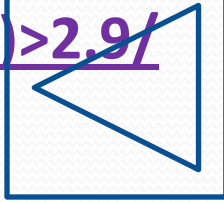
•DeltaZ

W+ONLY-TWOJETS/ $\Delta\phi(\text{Electron},\text{MET})>2.5/ \Delta\phi(\text{Leading},\text{Second})>2.9/$
 $\Delta Z(\text{Electron},\text{Leading})>0.04$ AND $\Delta Z(\text{Electron},\text{Second})>0.04$ AND
 $\Delta Z(\text{Second},\text{Leading})<0.04$ cm



•DeltaZ

W+ONLY-TWOJETS / $\Delta\phi(\text{Electron}, \text{MET}) > 2.5$ / $\Delta\phi(\text{Leading}, \text{Second}) > 2.9$ /
 $\Delta Z(\text{Electron}, \text{Leading}) < 0.04$ AND $\Delta Z(\text{Electron}, \text{Second}) < 0.04$ AND
 $\Delta Z(\text{Second}, \text{Leading}) < 0.04$ cm



•DeltaZ

W+ONLY-TWOJETS/ $\Delta\phi(\text{Electron},\text{MET})>2.5/ \Delta\phi(\text{Leading},\text{Second})>2.9/$
 $\Delta Z(\text{Electron},\text{Leading})<0.04$ AND $\Delta Z(\text{Electron},\text{Second})<0.04$ AND
 $\Delta Z(\text{Second},\text{Leading})<0.04$ cm

•DeltaZ

W+ONLY-TWOJETS/ $\Delta\phi(\text{Electron},\text{MET})>2.5/ \Delta\phi(\text{Leading},\text{Second})>2.9/$
 $\Delta Z(\text{Electron},\text{Leading})<0.04$ AND $\Delta Z(\text{Electron},\text{Second})<0.04$ AND
 $\Delta Z(\text{Second},\text{Leading})<0.04$ cm



•DeltaZ

W+ONLY-TWOJETS / $\Delta\phi(\text{Electron}, \text{MET}) > 2.5$ / $\Delta\phi(\text{Leading}, \text{Second}) > 2.9$ /
 $\Delta Z(\text{Electron}, \text{Leading}) < 0.04$ AND $\Delta Z(\text{Electron}, \text{Second}) < 0.04$ AND
 $\Delta Z(\text{Second}, \text{Leading}) < 0.04$ cm

•DeltaZ

W+ONLY-TWOJETS / $\Delta\phi(\text{Electron}, \text{MET}) > 2.5$ / $\Delta\phi(\text{Leading}, \text{Second}) > 2.9$ /
 $\Delta Z(\text{Electron}, \text{Leading}) < 0.04$ AND $\Delta Z(\text{Electron}, \text{Second}) < 0.04$ AND
 $\Delta Z(\text{Second}, \text{Leading}) < 0.04$ cm

•DeltaZ

W+ONLY-TWOJETS / $\Delta\phi(\text{Electron}, \text{MET}) > 2.5$ / $\Delta\phi(\text{Leading}, \text{Second}) > 2.9$ /
 $\Delta Z(\text{Electron}, \text{Leading}) < 0.04$ AND $\Delta Z(\text{Electron}, \text{Second}) < 0.04$ AND
 $\Delta Z(\text{Second}, \text{Leading}) < 0.04$ cm

•DeltaZ

W+ONLY-TWOJETS / $\Delta\phi(\text{Electron}, \text{MET}) > 2.5$ / $\Delta\phi(\text{Leading}, \text{Second}) > 2.9$ /
 $\Delta Z(\text{Electron}, \text{Leading}) < 0.04$ AND $\Delta Z(\text{Electron}, \text{Second}) < 0.04$ AND
 $\Delta Z(\text{Second}, \text{Leading}) < 0.04$ cm

•DeltaZ

W+ONLY-TWOJETS / $\Delta\phi(\text{Electron}, \text{MET}) > 2.5$ / $\Delta\phi(\text{Leading}, \text{Second}) > 2.9$ /
 $\Delta Z(\text{Electron}, \text{Leading}) < 0.04$ AND $\Delta Z(\text{Electron}, \text{Second}) < 0.04$ AND
 $\Delta Z(\text{Second}, \text{Leading}) < 0.04$ cm



•DeltaZ

W+ONLY-TWOJETS / $\Delta\phi(\text{Electron}, \text{MET}) > 2.5$ / $\Delta\phi(\text{Leading}, \text{Second}) > 2.9$ /
 $\Delta Z(\text{Electron}, \text{Leading}) < 0.04$ AND $\Delta Z(\text{Electron}, \text{Second}) < 0.04$ AND
 $\Delta Z(\text{Second}, \text{Leading}) < 0.04$ cm



•DeltaZ

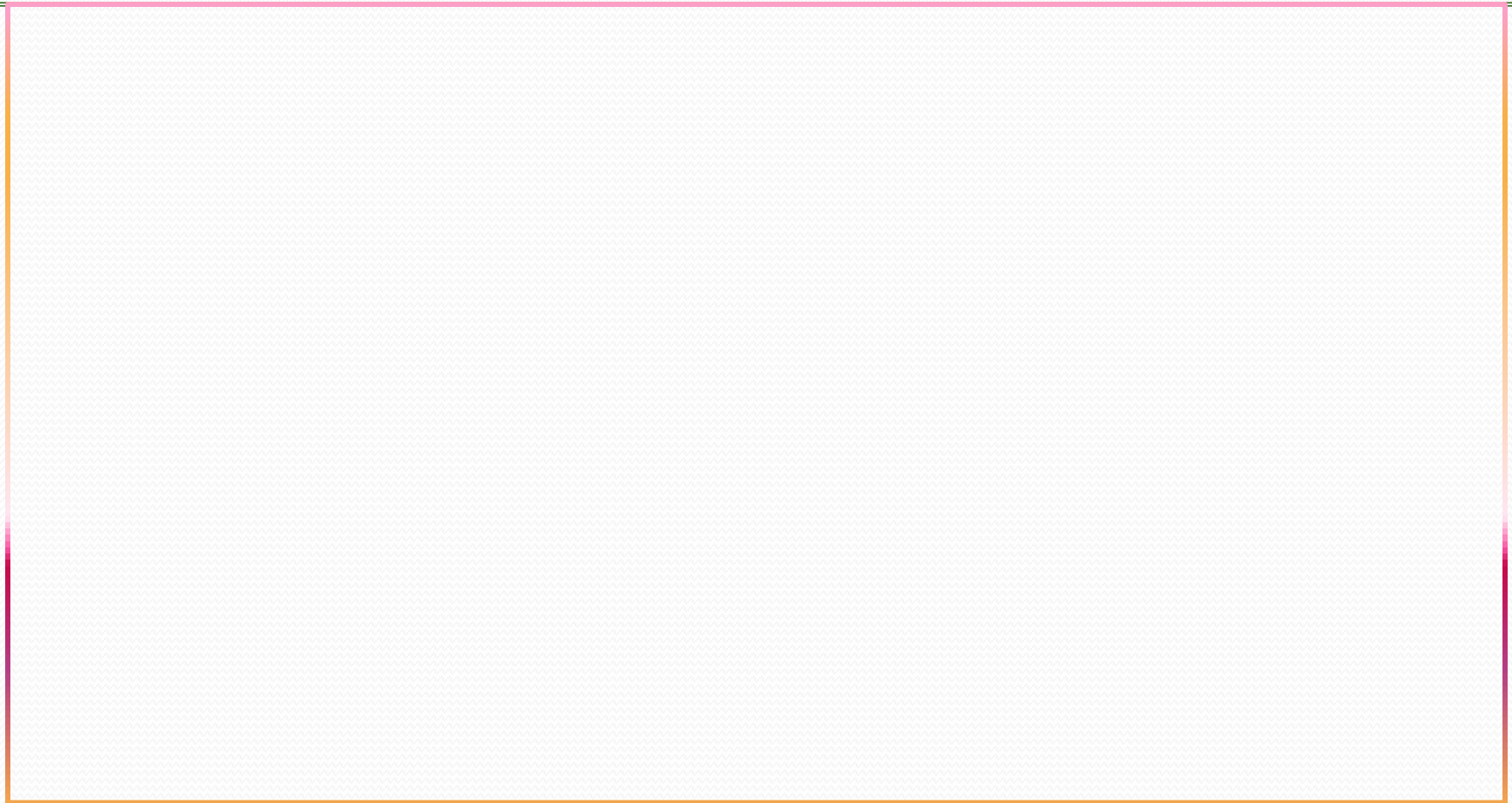
W+ONLY-TWOJETS / $\Delta\phi(\text{Electron}, \text{MET}) > 2.5$ / $\Delta\phi(\text{Leading}, \text{Second}) > 2.9$ /
 $\Delta Z(\text{Electron}, \text{Leading}) < 0.04$ AND $\Delta Z(\text{Electron}, \text{Second}) < 0.04$ AND
 $\Delta Z(\text{Second}, \text{Leading}) < 0.04$ cm

•DeltaZ

W+ONLY-TWOJETS / $\Delta\phi(\text{Electron}, \text{MET}) > 2.5$ / $\Delta\phi(\text{Leading}, \text{Second}) > 2.9$ /
 $\Delta Z(\text{Electron}, \text{Leading}) < 0.04$ AND $\Delta Z(\text{Electron}, \text{Second}) < 0.04$ AND
 $\Delta Z(\text{Second}, \text{Leading}) < 0.04$ cm

•DeltaZ

W+ONLY-TWOJETS / $\Delta\phi(\text{Electron}, \text{MET}) > 2.5$ / $\Delta\phi(\text{Leading}, \text{Second}) > 2.9$ /
 $\Delta Z(\text{Electron}, \text{Leading}) < 0.04$ AND $\Delta Z(\text{Electron}, \text{Second}) < 0.04$ AND
 $\Delta Z(\text{Second}, \text{Leading}) < 0.04$ cm

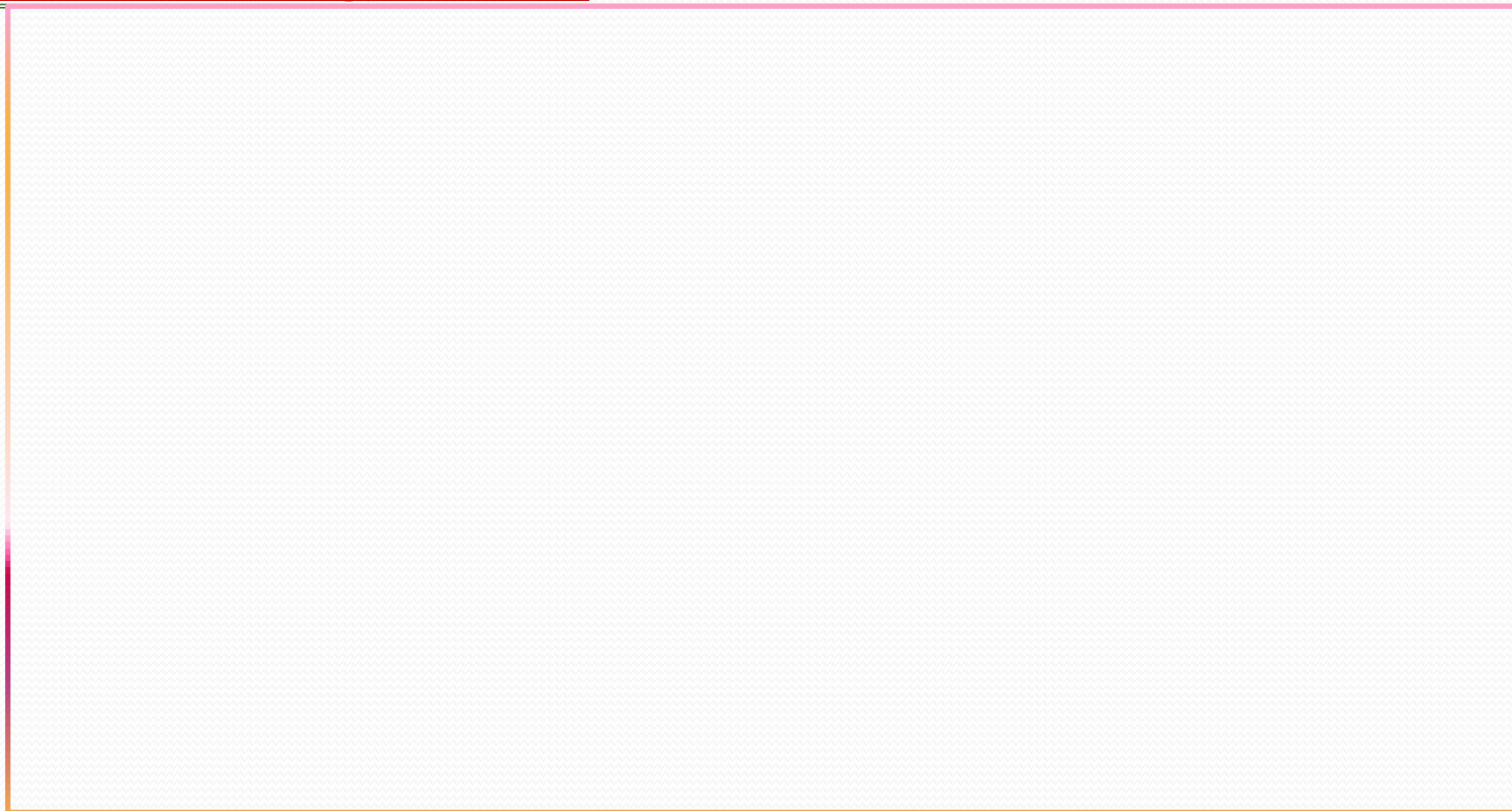


•DeltaZ

W+ONLY-TWOJETS / $\Delta\phi(\text{Electron}, \text{MET}) > 2.5$ / $\Delta\phi(\text{Leading}, \text{Second}) > 2.9$ /
 $\Delta Z(\text{Electron}, \text{Leading}) < 0.04$ AND $\Delta Z(\text{Electron}, \text{Second}) < 0.04$ AND
 $\Delta Z(\text{Second}, \text{Leading}) < 0.04$ cm

•DeltaZ

W+ONLY-TWOJETS / $\Delta\phi(\text{Electron}, \text{MET}) > 2.5$ / $\Delta\phi(\text{Leading}, \text{Second}) > 2.9$ /
 $\Delta Z(\text{Electron}, \text{Leading}) < 0.04$ AND $\Delta Z(\text{Electron}, \text{Second}) < 0.04$ AND
 $\Delta Z(\text{Second}, \text{Leading}) < 0.04$ cm



•DeltaZ

W+ONLY-TWOJETS / $\Delta\phi(\text{Electron}, \text{MET}) > 2.5$ / $\Delta\phi(\text{Leading}, \text{Second}) > 2.9$ /
 $\Delta Z(\text{Electron}, \text{Leading}) < 0.04$ AND $\Delta Z(\text{Electron}, \text{Second}) < 0.04$ AND
 $\Delta Z(\text{Second}, \text{Leading}) < 0.04$ cm

•DeltaZ

W+ONLY-TWOJETS / $\Delta\phi(\text{Electron}, \text{MET}) > 2.5$ / $\Delta\phi(\text{Leading}, \text{Second}) > 2.9$ /
 $\Delta Z(\text{Electron}, \text{Leading}) < 0.04$ AND $\Delta Z(\text{Electron}, \text{Second}) < 0.04$ AND
 $\Delta Z(\text{Second}, \text{Leading}) < 0.04$ cm

•DeltaZ

W+ONLY-TWOJETS / $\Delta\phi(\text{Electron}, \text{MET}) > 2.5$ / $\Delta\phi(\text{Leading}, \text{Second}) > 2.9$ /
 $\Delta Z(\text{Electron}, \text{Leading}) < 0.04$ AND $\Delta Z(\text{Electron}, \text{Second}) < 0.04$ AND
 $\Delta Z(\text{Second}, \text{Leading}) < 0.04$ cm

•DeltaZ

W+ONLY-TWOJETS / $\Delta\phi(\text{Electron}, \text{MET}) > 2.5$ / $\Delta\phi(\text{Leading}, \text{Second}) > 2.9$ /
 $\Delta Z(\text{Electron}, \text{Leading}) < 0.04$ AND $\Delta Z(\text{Electron}, \text{Second}) < 0.04$ AND
 $\Delta Z(\text{Second}, \text{Leading}) < 0.04$ cm

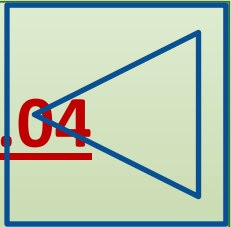
•DeltaZ

W+ONLY-TWOJETS/ $\Delta\phi(\text{Electron},\text{MET})>2.5/ \Delta\phi(\text{Leading},\text{Second})>2.9/$
 $\Delta Z(\text{Electron},\text{Leading})<0.04$ AND $\Delta Z(\text{Electron},\text{Second})<0.04$ AND
 $\Delta Z(\text{Second},\text{Leading})<0.04$ cm

•DeltaZ

W+ONLY-TWOJETS / $\Delta\phi(\text{Electron}, \text{MET}) < 2.5$

$\Delta Z(\text{Electron}, \text{Leading}) < 0.04$ AND $\Delta Z(\text{Electron}, \text{Second}) < 0.04$
AND $\Delta Z(\text{Second}, \text{Leading}) < 0.04$ cm



•DeltaZ

W+ONLY-TWOJETS / $\Delta\phi(\text{Electron}, \text{MET}) < 2.5$

$\Delta Z(\text{Electron}, \text{Leading}) < 0.04$ AND $\Delta Z(\text{Electron}, \text{Second}) < 0.04$
AND $\Delta Z(\text{Second}, \text{Leading}) < 0.04$ cm



•DeltaZ

W+ONLY-TWOJETS / $\Delta\phi(\text{Electron}, \text{MET}) < 2.5$

$\Delta Z(\text{Electron}, \text{Leading}) < 0.04$ AND $\Delta Z(\text{Electron}, \text{Second}) < 0.04$
AND $\Delta Z(\text{Second}, \text{Leading}) < 0.04$ cm



•DeltaZ

W+ONLY-TWOJETS / $\Delta\phi(\text{Electron}, \text{MET}) < 2.5$

$\Delta Z(\text{Electron}, \text{Leading}) < 0.04$ AND $\Delta Z(\text{Electron}, \text{Second}) < 0.04$
AND $\Delta Z(\text{Second}, \text{Leading}) < 0.04$ cm



•DeltaZ

W+ONLY-TWOJETS / $\Delta\phi(\text{Electron}, \text{MET}) < 2.5$

$\Delta Z(\text{Electron}, \text{Leading}) < 0.04$ AND $\Delta Z(\text{Electron}, \text{Second}) < 0.04$
AND $\Delta Z(\text{Second}, \text{Leading}) < 0.04$ cm



•DeltaZ

W+ONLY-TWOJETS / $\Delta\phi(\text{Electron}, \text{MET}) < 2.5$

$\Delta Z(\text{Electron}, \text{Leading}) < 0.04$ AND $\Delta Z(\text{Electron}, \text{Second}) < 0.04$
AND $\Delta Z(\text{Second}, \text{Leading}) < 0.04$ cm



•DeltaZ

W+ONLY-TWOJETS / $\Delta\phi(\text{Electron}, \text{MET}) < 2.5$

$\Delta Z(\text{Electron}, \text{Leading}) < 0.04$ AND $\Delta Z(\text{Electron}, \text{Second}) < 0.04$
AND $\Delta Z(\text{Second}, \text{Leading}) < 0.04$ cm



•DeltaZ

W+ONLY-TWOJETS / $\Delta\phi(\text{Electron}, \text{MET}) < 2.5$

$\Delta Z(\text{Electron}, \text{Leading}) < 0.04$ AND $\Delta Z(\text{Electron}, \text{Second}) < 0.04$
AND $\Delta Z(\text{Second}, \text{Leading}) < 0.04$ cm



•DeltaZ

W+ONLY-TWOJETS / $\Delta\phi(\text{Electron}, \text{MET}) < 2.5$

$\Delta Z(\text{Electron}, \text{Leading}) < 0.04$ AND $\Delta Z(\text{Electron}, \text{Second}) < 0.04$
AND $\Delta Z(\text{Second}, \text{Leading}) < 0.04$ cm



•DeltaZ

W+ONLY-TWOJETS / $\Delta\phi(\text{Electron}, \text{MET}) < 2.5$

$\Delta Z(\text{Electron}, \text{Leading}) < 0.04$ AND $\Delta Z(\text{Electron}, \text{Second}) < 0.04$
AND $\Delta Z(\text{Second}, \text{Leading}) < 0.04$ cm

•DeltaZ

W+ONLY-TWOJETS / $\Delta\phi(\text{Electron}, \text{MET}) < 2.5$

$\Delta Z(\text{Electron}, \text{Leading}) < 0.04$ AND $\Delta Z(\text{Electron}, \text{Second}) < 0.04$
AND $\Delta Z(\text{Second}, \text{Leading}) < 0.04$ cm



•DeltaZ

W+ONLY-TWOJETS / $\Delta\phi(\text{Electron}, \text{MET}) < 2.5$

$\Delta Z(\text{Electron}, \text{Leading}) < 0.04$ AND $\Delta Z(\text{Electron}, \text{Second}) < 0.04$
AND $\Delta Z(\text{Second}, \text{Leading}) < 0.04$ cm



•DeltaZ

W+ONLY-TWOJETS / $\Delta\phi(\text{Electron}, \text{MET}) < 2.5$

$\Delta Z(\text{Electron}, \text{Leading}) < 0.04$ AND $\Delta Z(\text{Electron}, \text{Second}) < 0.04$
AND $\Delta Z(\text{Second}, \text{Leading}) < 0.04$ cm



•DeltaZ

W+ONLY-TWOJETS / $\Delta\phi(\text{Electron}, \text{MET}) < 2.5$

$\Delta Z(\text{Electron}, \text{Leading}) < 0.04$ AND $\Delta Z(\text{Electron}, \text{Second}) < 0.04$
AND $\Delta Z(\text{Second}, \text{Leading}) < 0.04$ cm

•DeltaZ

W+ONLY-TWOJETS / $\Delta\phi(\text{Electron}, \text{MET}) < 2.5$

$\Delta Z(\text{Electron}, \text{Leading}) < 0.04$ AND $\Delta Z(\text{Electron}, \text{Second}) < 0.04$
AND $\Delta Z(\text{Second}, \text{Leading}) < 0.04$ cm

•DeltaZ

W+ONLY-TWOJETS / $\Delta\phi(\text{Electron}, \text{MET}) < 2.5$

$\Delta Z(\text{Electron}, \text{Leading}) < 0.04$ AND $\Delta Z(\text{Electron}, \text{Second}) < 0.04$
AND $\Delta Z(\text{Second}, \text{Leading}) < 0.04$ cm



•DeltaZ

W+ONLY-TWOJETS / $\Delta\phi(\text{Electron}, \text{MET}) < 2.5$

$\Delta Z(\text{Electron}, \text{Leading}) < 0.04$ AND $\Delta Z(\text{Electron}, \text{Second}) < 0.04$
AND $\Delta Z(\text{Second}, \text{Leading}) < 0.04$ cm



•DeltaZ

W+ONLY-TWOJETS / $\Delta\phi(\text{Electron}, \text{MET}) < 2.5$

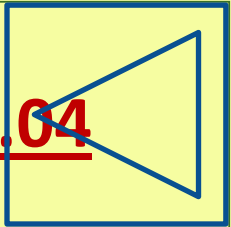
$\Delta Z(\text{Electron}, \text{Leading}) < 0.04$ AND $\Delta Z(\text{Electron}, \text{Second}) < 0.04$
AND $\Delta Z(\text{Second}, \text{Leading}) < 0.04$ cm



•DeltaZ

W+ONLY-TWOJETS / $\Delta\phi(\text{Electron}, \text{MET}) < 2.5$

$\Delta Z(\text{Electron}, \text{Leading}) > 0.04$ AND $\Delta Z(\text{Electron}, \text{Second}) > 0.04$
AND $\Delta Z(\text{Second}, \text{Leading}) < 0.04$ cm



•DeltaZ

W+ONLY-TWOJETS / $\Delta\phi(\text{Electron}, \text{MET}) < 2.5$

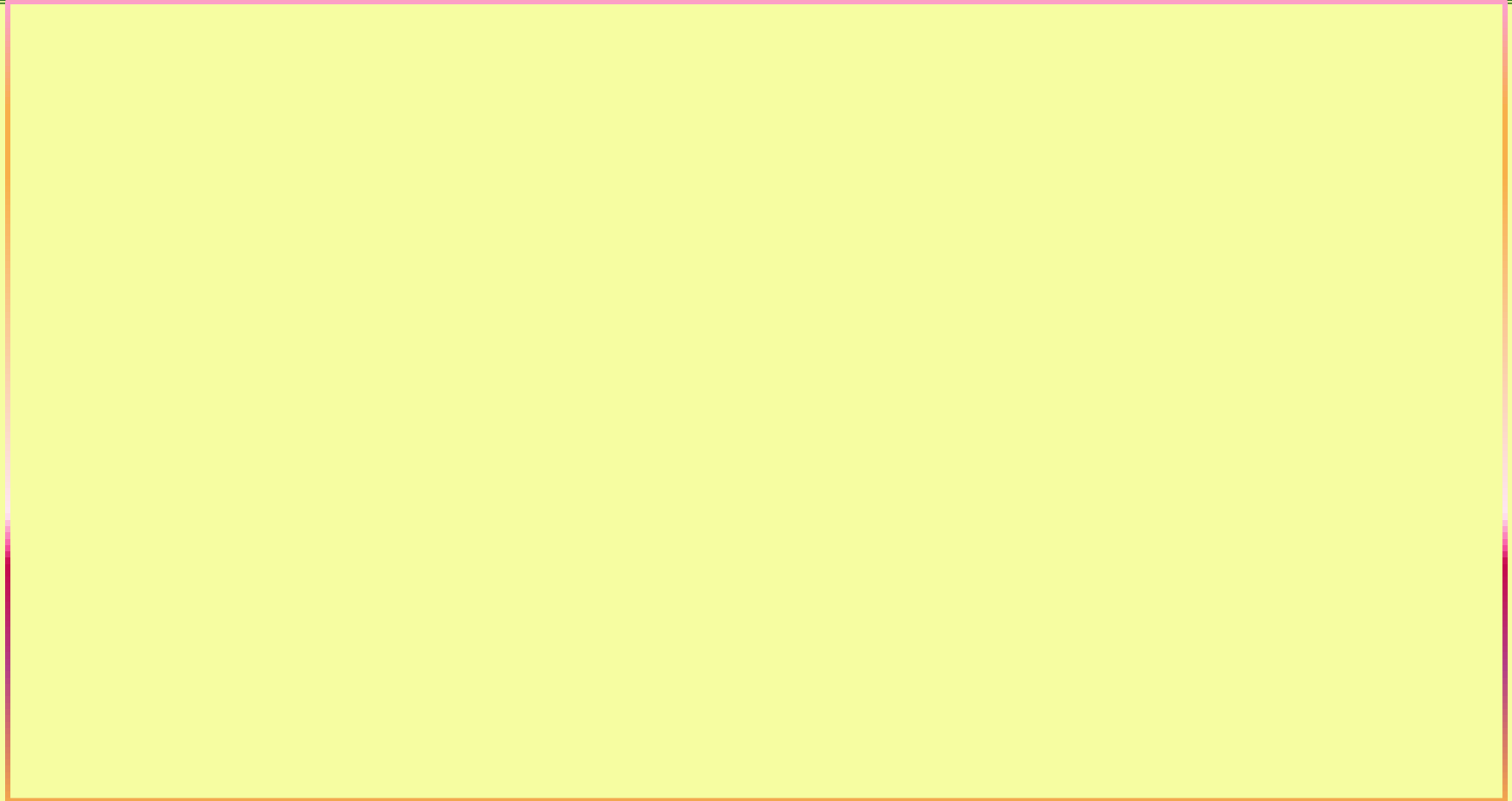
$\Delta Z(\text{Electron}, \text{Leading}) > 0.04$ AND $\Delta Z(\text{Electron}, \text{Second}) > 0.04$
AND $\Delta Z(\text{Second}, \text{Leading}) < 0.04$ cm

BACK TO
OUTLINE
SLIDE

•DeltaZ

W+ONLY-TWOJETS / $\Delta\phi(\text{Electron}, \text{MET}) < 2.5$

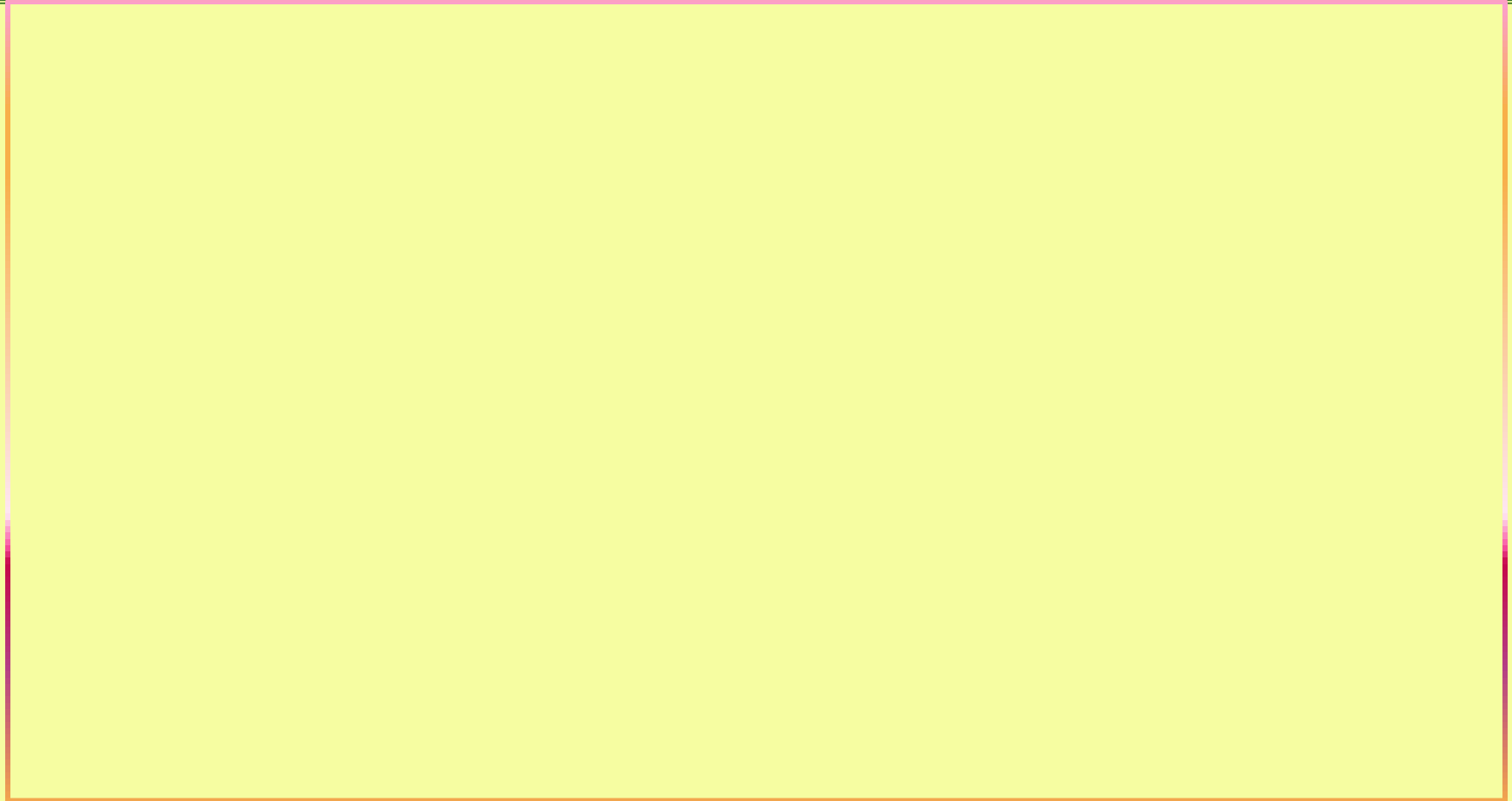
$\Delta Z(\text{Electron}, \text{Leading}) > 0.04$ AND $\Delta Z(\text{Electron}, \text{Second}) > 0.04$
AND $\Delta Z(\text{Second}, \text{Leading}) < 0.04$ cm



•DeltaZ

W+ONLY-TWOJETS / $\Delta\phi(\text{Electron}, \text{MET}) < 2.5$

$\Delta Z(\text{Electron}, \text{Leading}) > 0.04$ AND $\Delta Z(\text{Electron}, \text{Second}) > 0.04$
AND $\Delta Z(\text{Second}, \text{Leading}) < 0.04$ cm



•DeltaZ

W+ONLY-TWOJETS/ $\Delta\phi(\text{Electron}, \text{MET}) < 2.5$

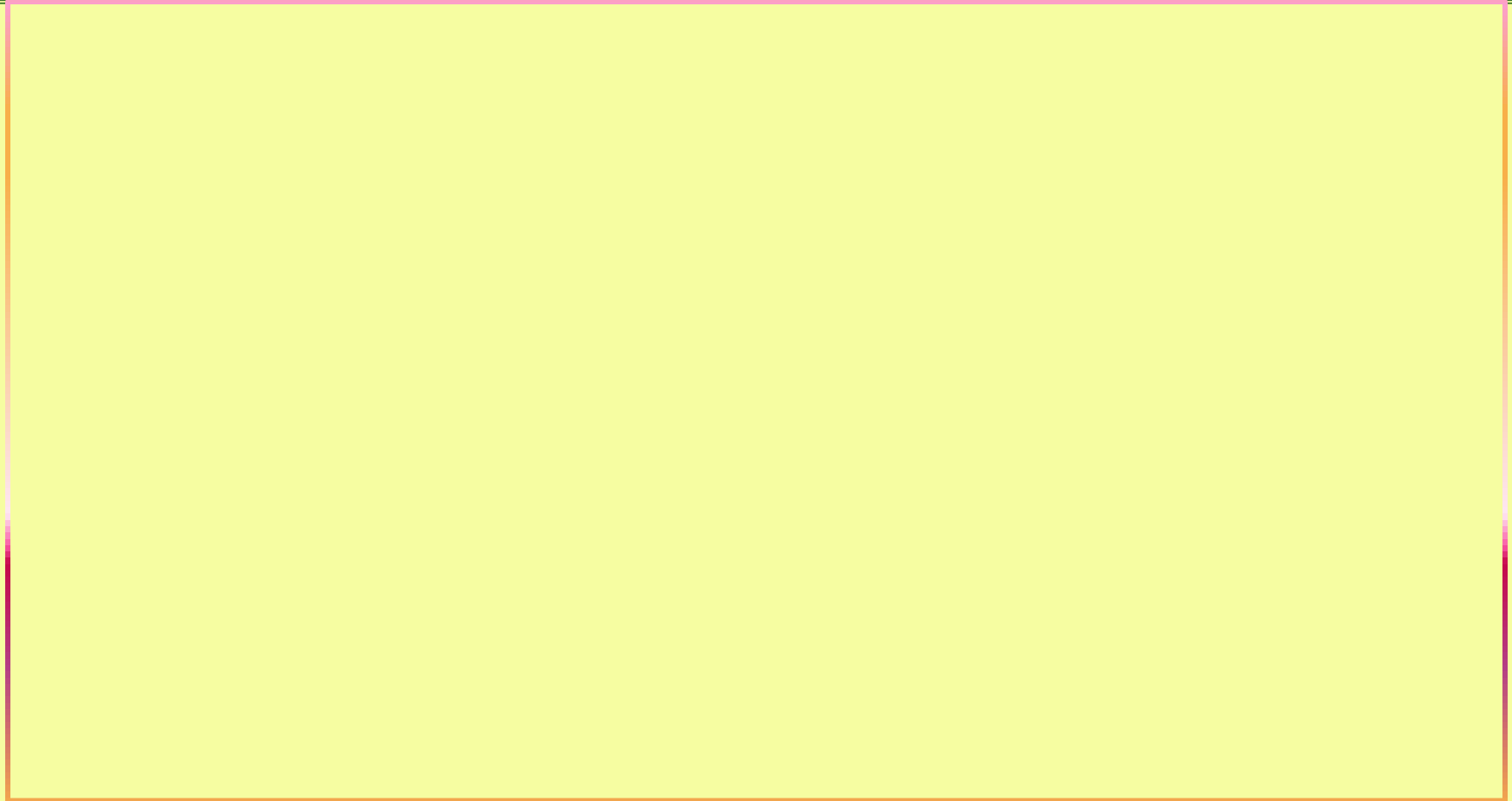
$\Delta Z(\text{Electron}, \text{Leading}) > 0.04$ AND $\Delta Z(\text{Electron}, \text{Second}) > 0.04$
AND $\Delta Z(\text{Second}, \text{Leading}) < 0.04$ cm



•DeltaZ

W+ONLY-TWOJETS/ $\Delta\phi(\text{Electron}, \text{MET}) < 2.5$

$\Delta Z(\text{Electron}, \text{Leading}) > 0.04$ AND $\Delta Z(\text{Electron}, \text{Second}) > 0.04$
AND $\Delta Z(\text{Second}, \text{Leading}) < 0.04$ cm



•DeltaZ

W+ONLY-TWOJETS/ $\Delta\phi(\text{Electron}, \text{MET}) < 2.5$

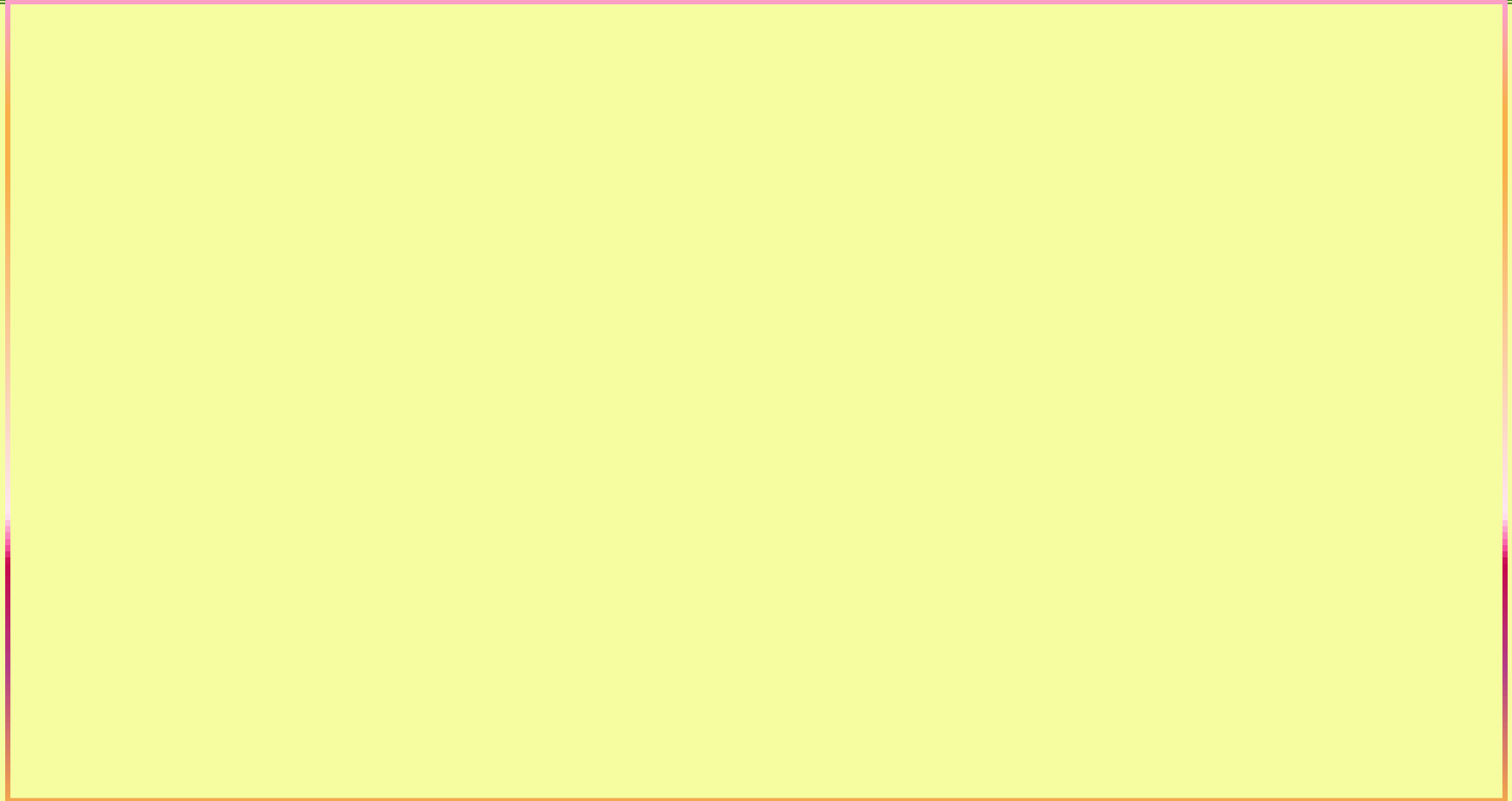
$\Delta Z(\text{Electron}, \text{Leading}) > 0.04$ AND $\Delta Z(\text{Electron}, \text{Second}) > 0.04$
AND $\Delta Z(\text{Second}, \text{Leading}) < 0.04$ cm



•DeltaZ

W+ONLY-TWOJETS/ $\Delta\phi(\text{Electron},\text{MET}) < 2.5$

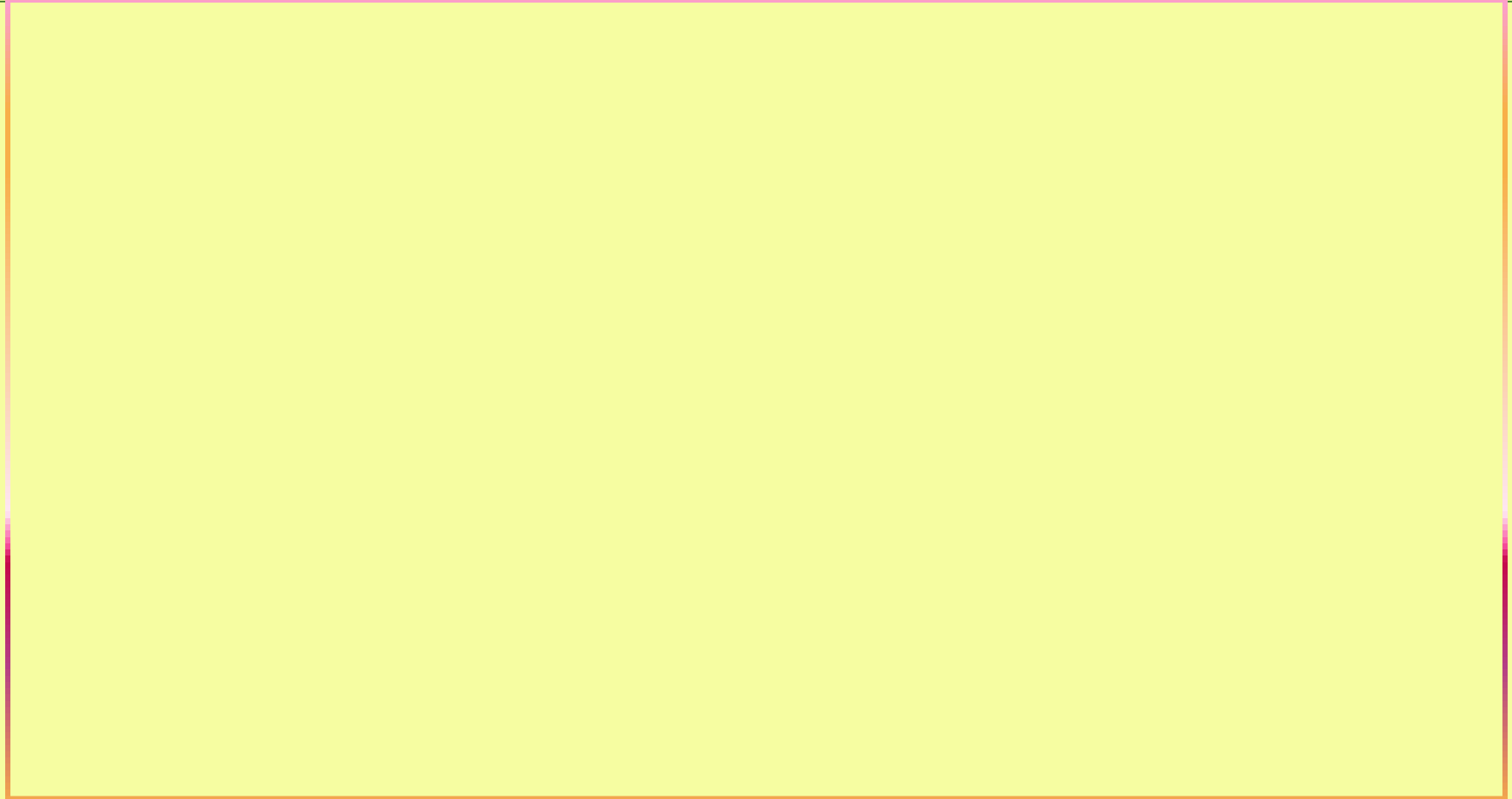
$\Delta Z(\text{Electron},\text{Leading}) > 0.04$ AND $\Delta Z(\text{Electron},\text{Second}) > 0.04$
AND $\Delta Z(\text{Second},\text{Leading}) < 0.04$ cm



•DeltaZ

W+ONLY-TWOJETS / $\Delta\phi(\text{Electron}, \text{MET}) < 2.5$

$\Delta Z(\text{Electron}, \text{Leading}) > 0.04$ AND $\Delta Z(\text{Electron}, \text{Second}) > 0.04$
AND $\Delta Z(\text{Second}, \text{Leading}) < 0.04$ cm



•DeltaZ

W+ONLY-TWOJETS / $\Delta\phi(\text{Electron}, \text{MET}) < 2.5$

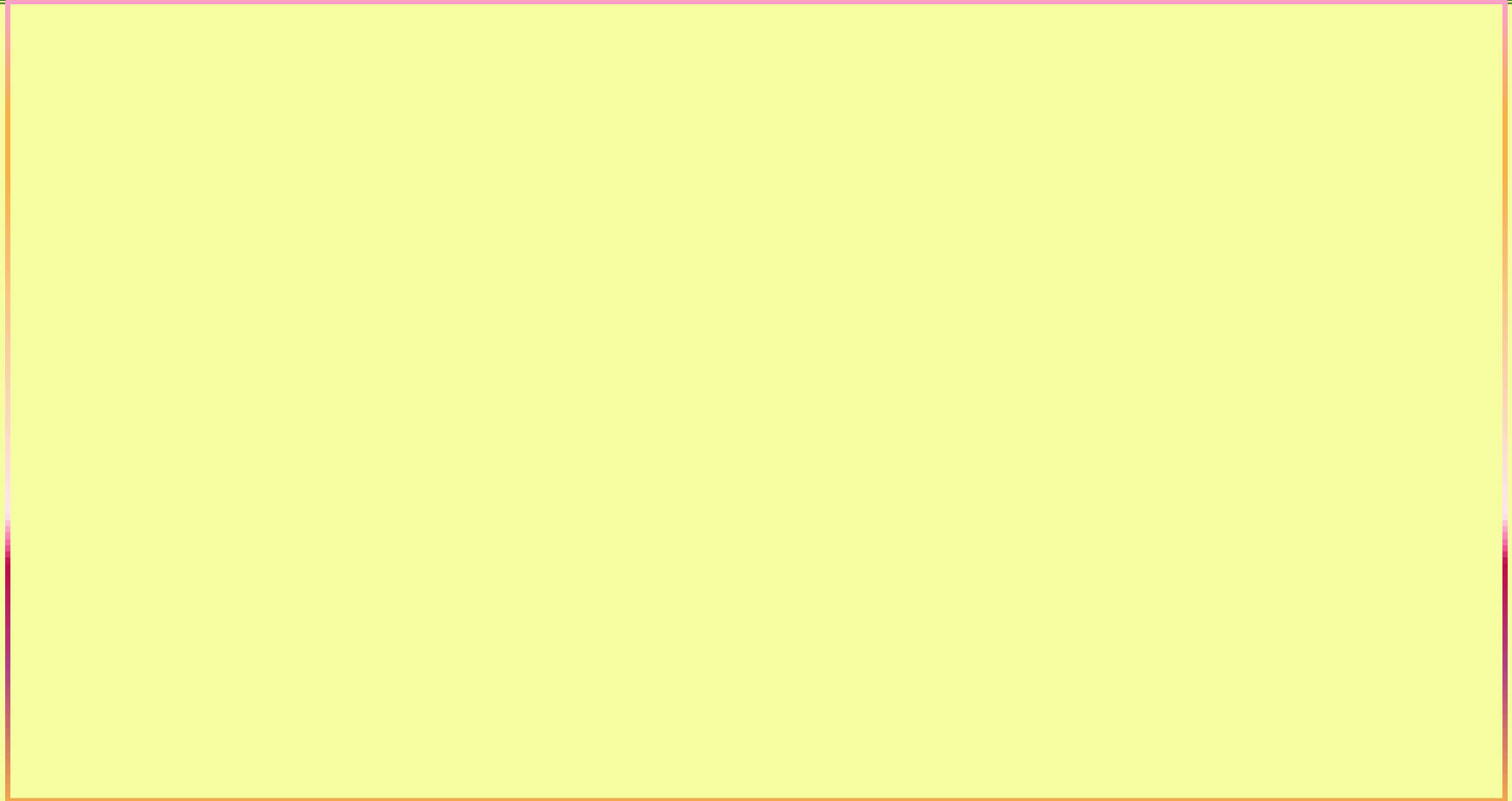
$\Delta Z(\text{Electron}, \text{Leading}) > 0.04$ AND $\Delta Z(\text{Electron}, \text{Second}) > 0.04$
AND $\Delta Z(\text{Second}, \text{Leading}) < 0.04$ cm



•DeltaZ

W+ONLY-TWOJETS / $\Delta\phi(\text{Electron}, \text{MET}) < 2.5$

$\Delta Z(\text{Electron}, \text{Leading}) > 0.04$ AND $\Delta Z(\text{Electron}, \text{Second}) > 0.04$
AND $\Delta Z(\text{Second}, \text{Leading}) < 0.04$ cm



•DeltaZ

W+ONLY-TWOJETS/ $\Delta\phi(\text{Electron}, \text{MET}) < 2.5$

$\Delta Z(\text{Electron}, \text{Leading}) > 0.04$ AND $\Delta Z(\text{Electron}, \text{Second}) > 0.04$
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•DeltaZ

W+ONLY-TWOJETS/ $\Delta\phi(\text{Electron}, \text{MET}) < 2.5$

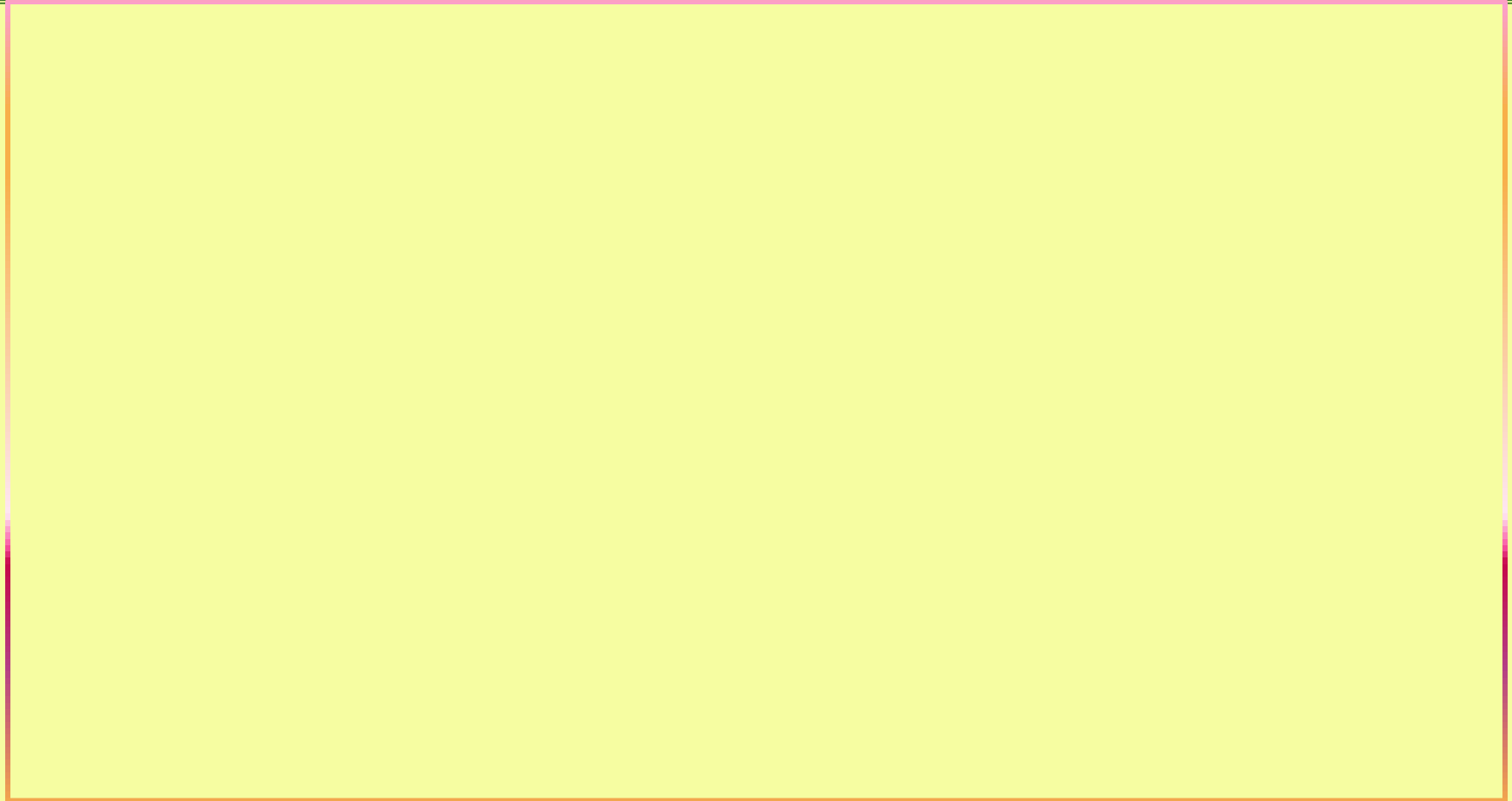
$\Delta Z(\text{Electron}, \text{Leading}) > 0.04$ AND $\Delta Z(\text{Electron}, \text{Second}) > 0.04$
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•DeltaZ

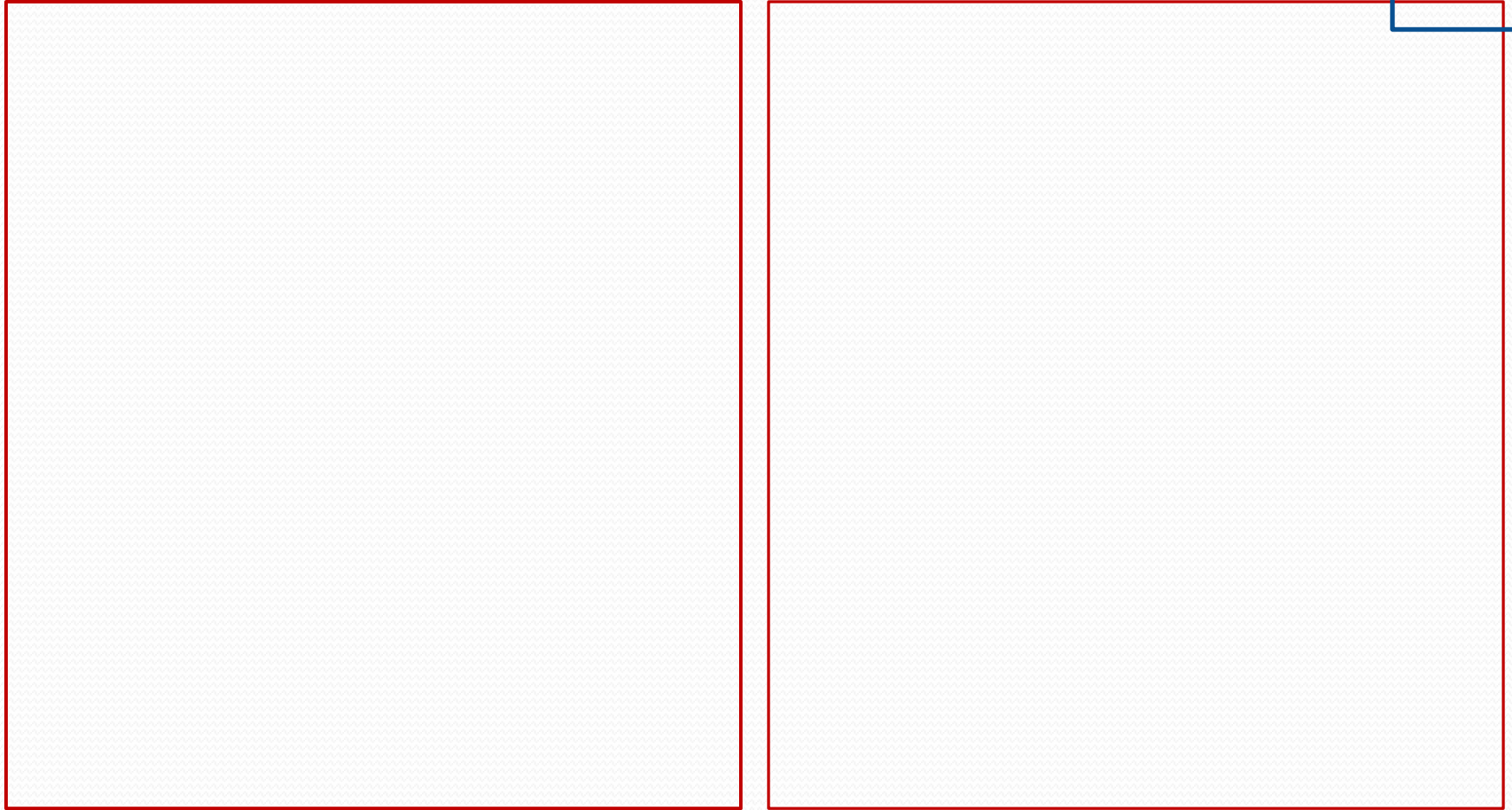
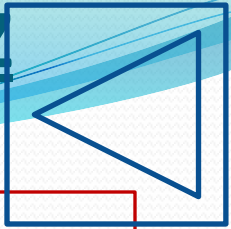
W+ONLY-TWOJETS/ $\Delta\phi(\text{Electron}, \text{MET}) < 2.5$

$\Delta Z(\text{Electron}, \text{Leading}) > 0.04$ AND $\Delta Z(\text{Electron}, \text{Second}) > 0.04$
AND $\Delta Z(\text{Second}, \text{Leading}) < 0.04$ cm



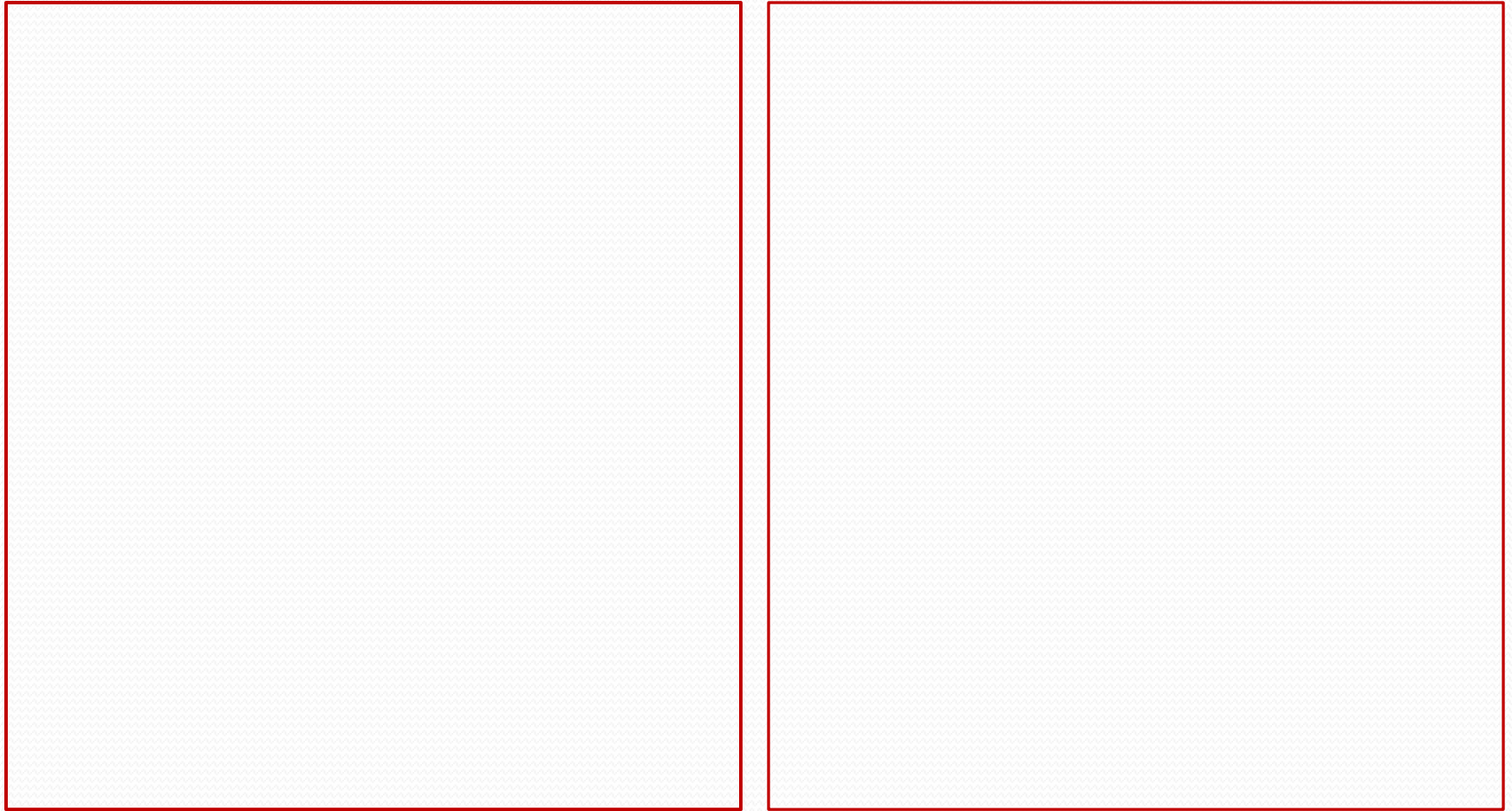
•DeltaZ

Jet Track (SVX Tracks Before the Final Jet Z Calculation)



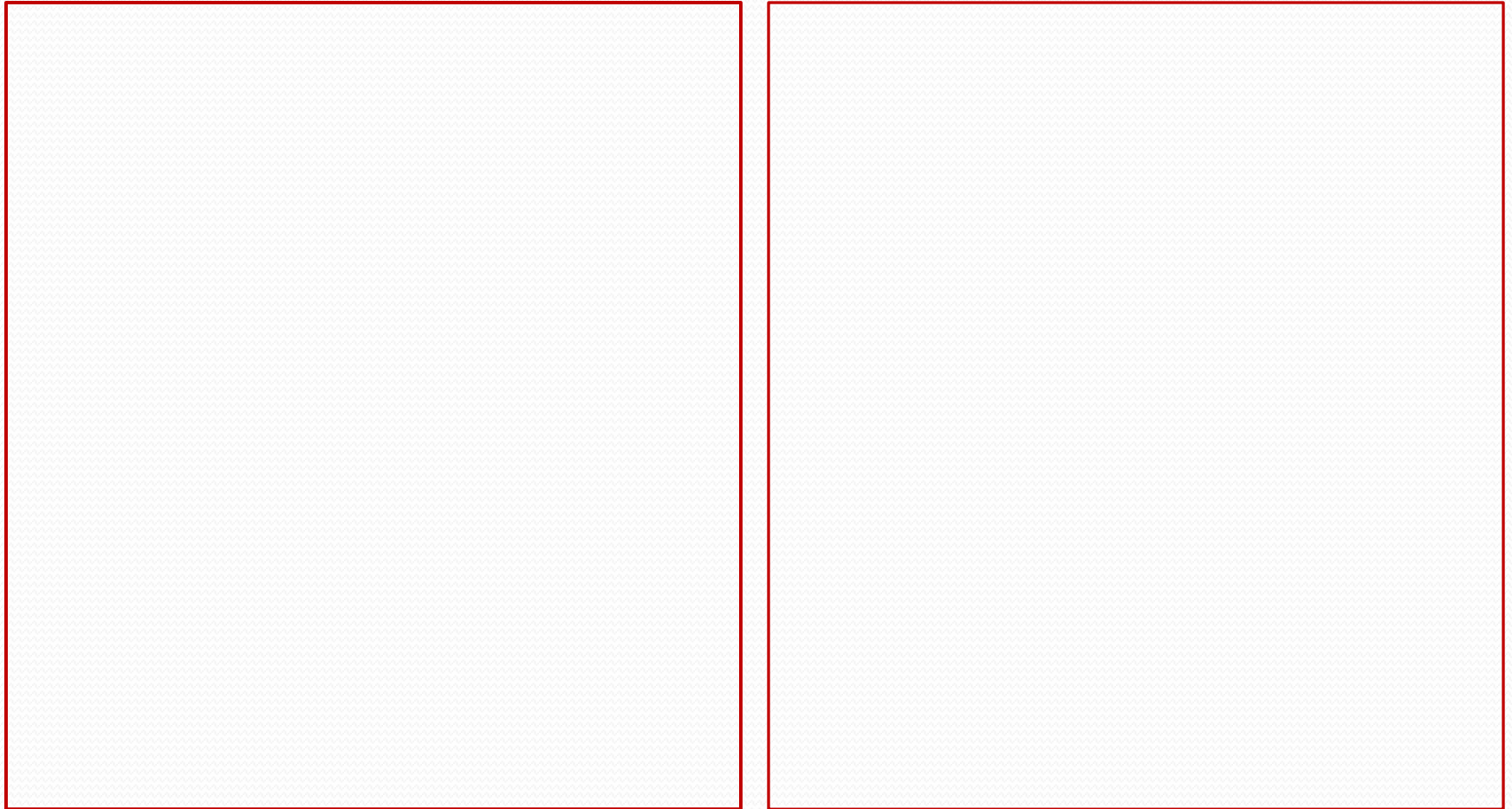
- Electron

Jet Track (SVX Tracks Before the Final Jet Z Calculation)



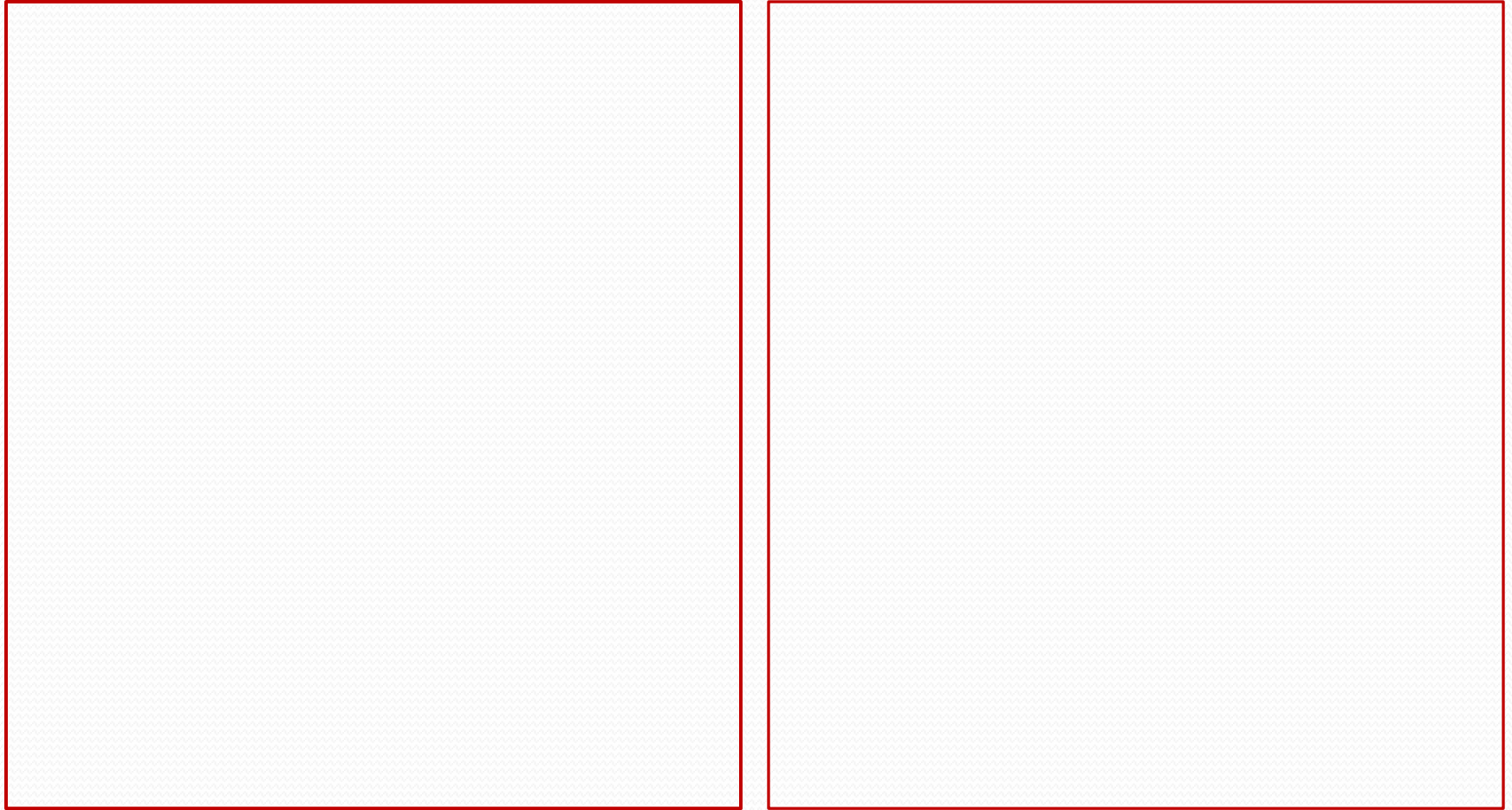
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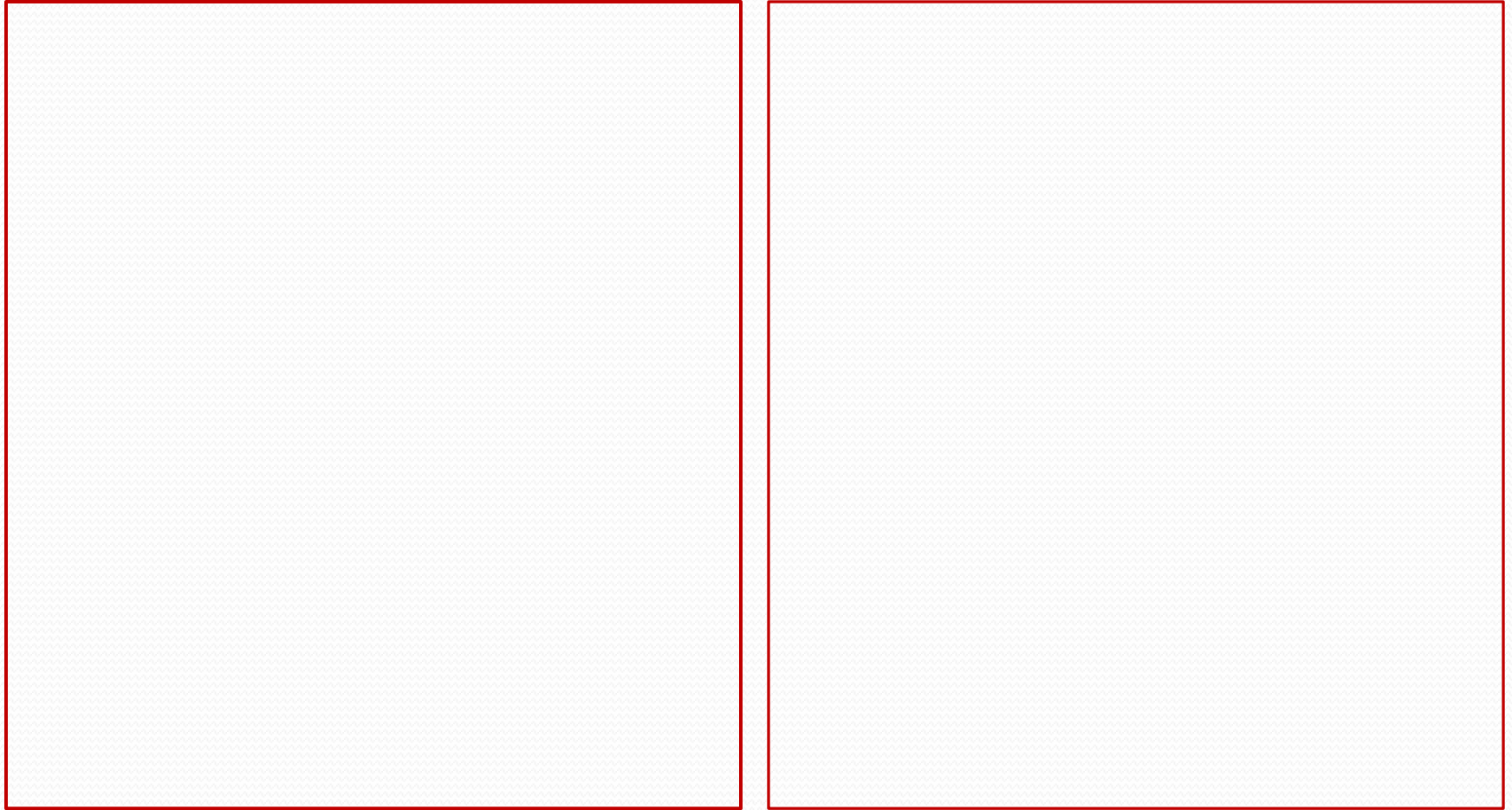
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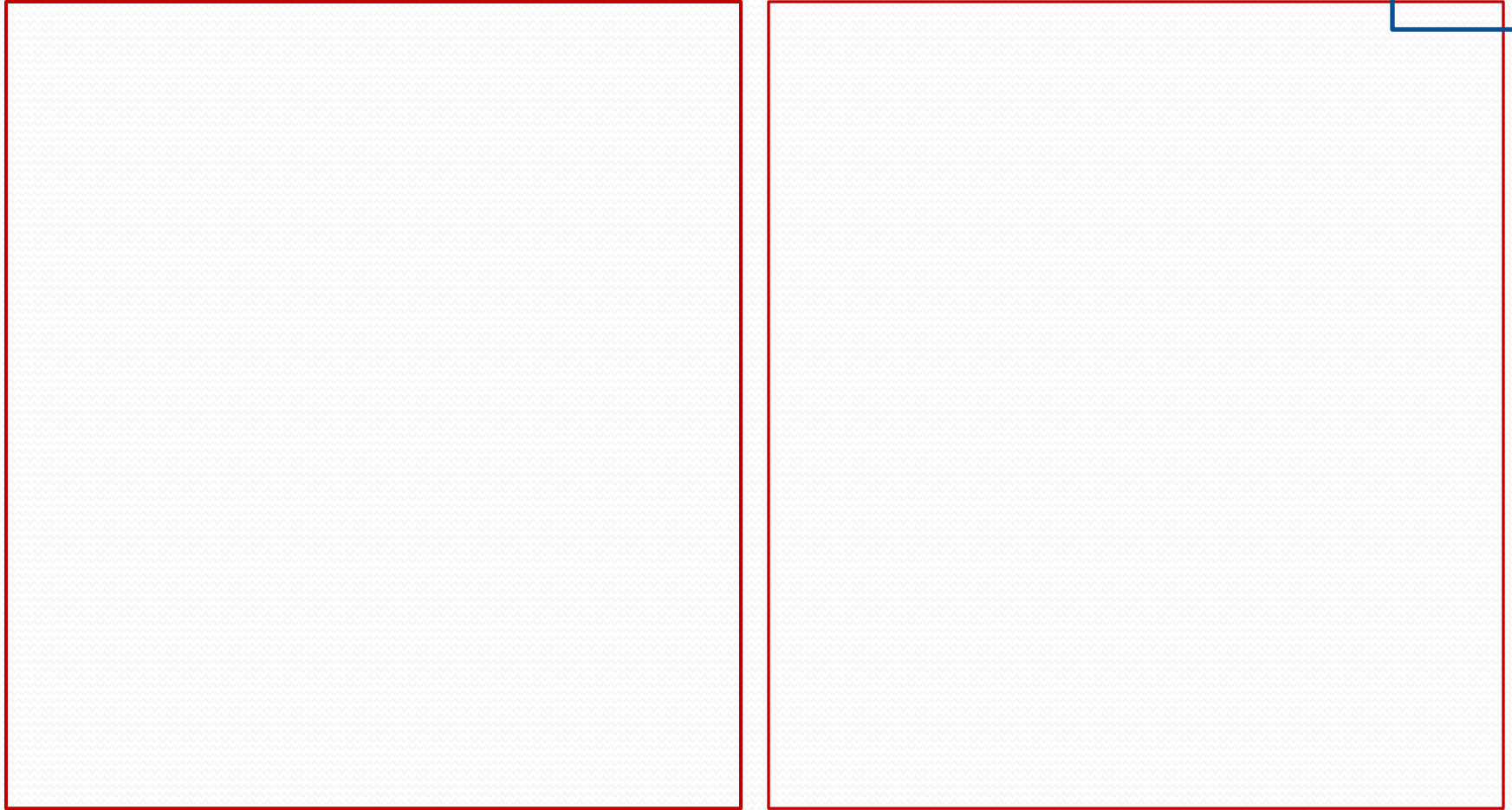
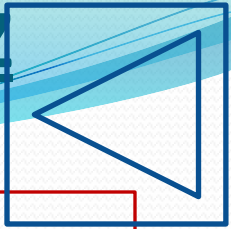
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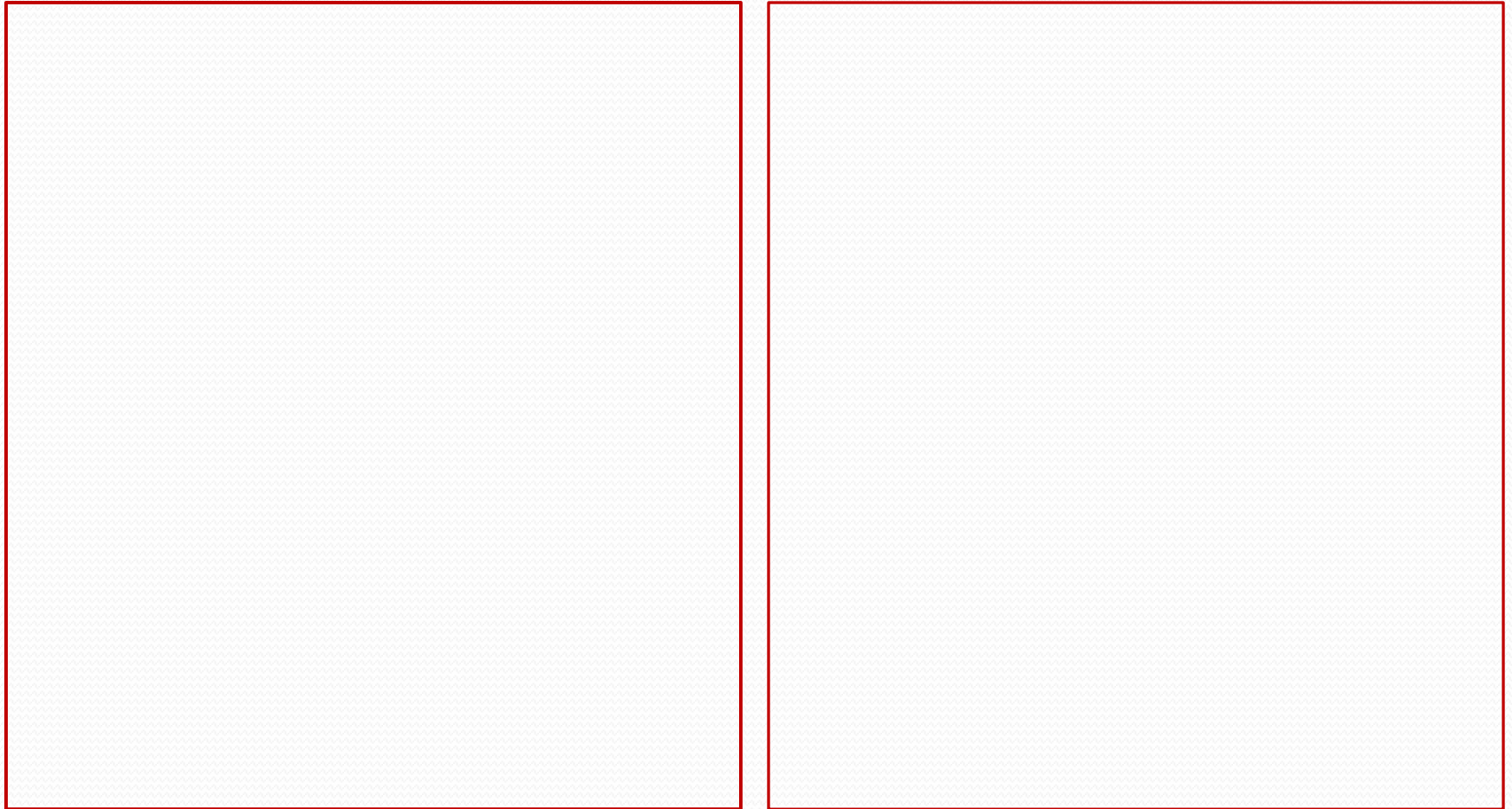
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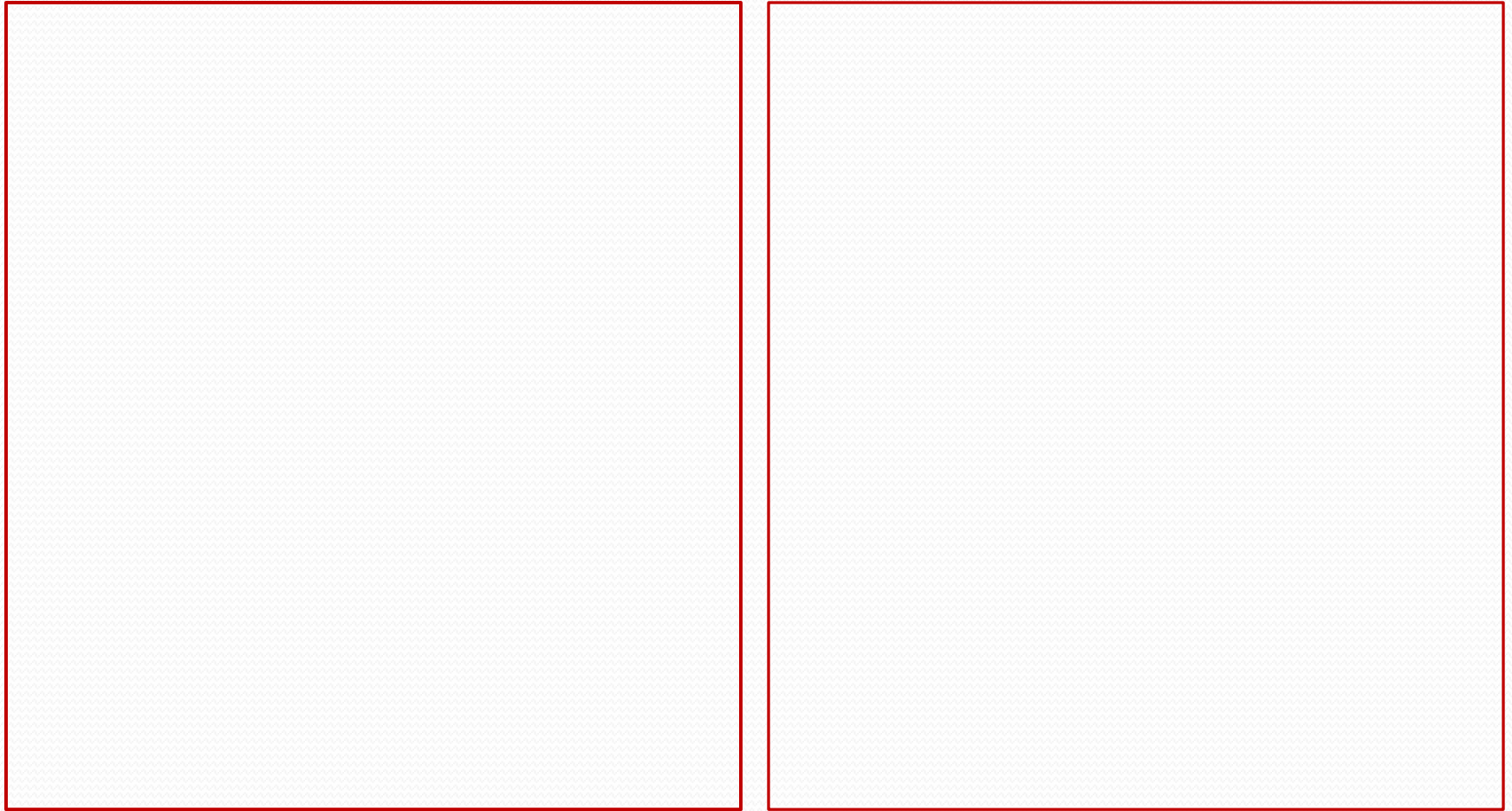
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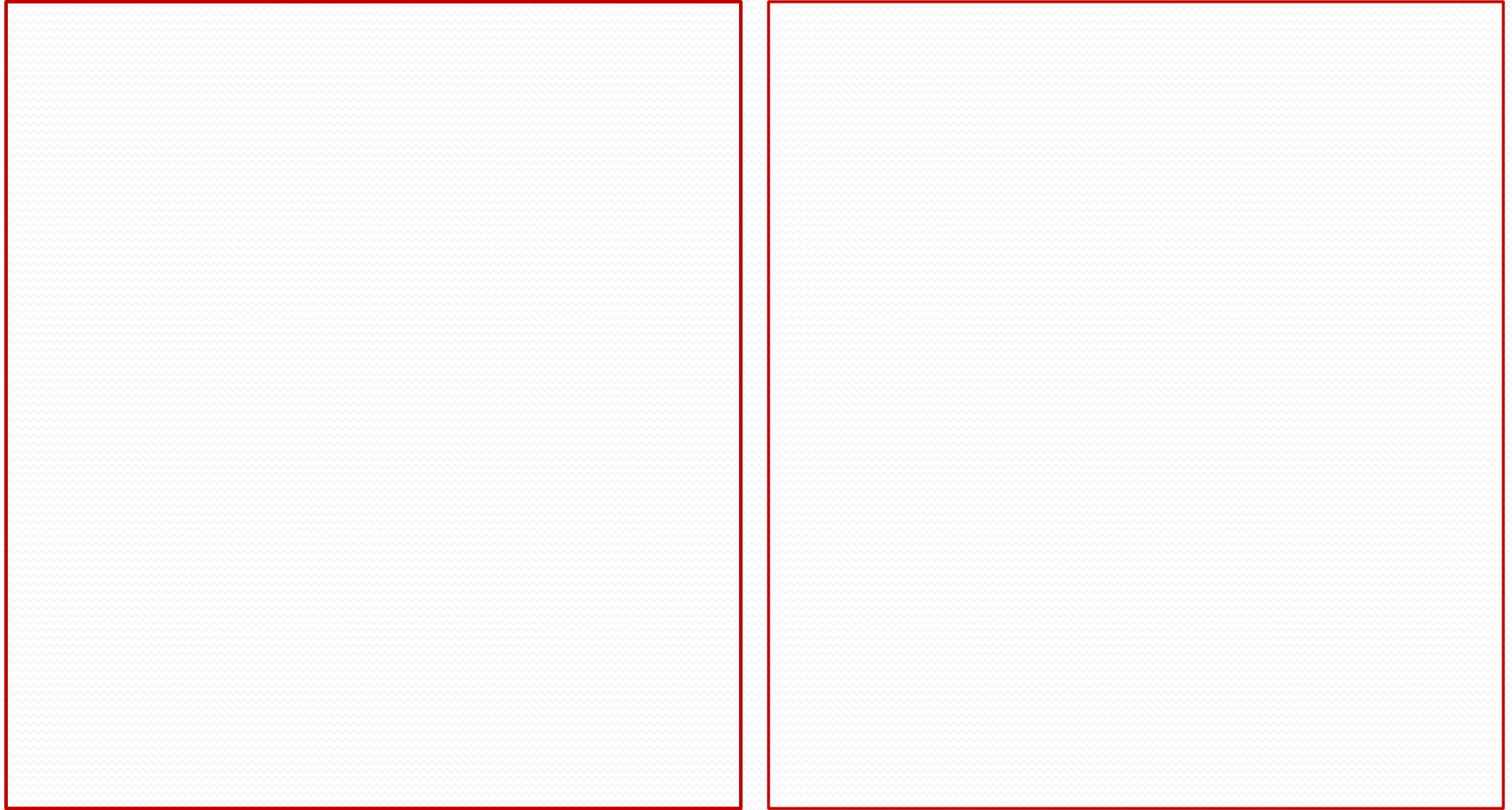
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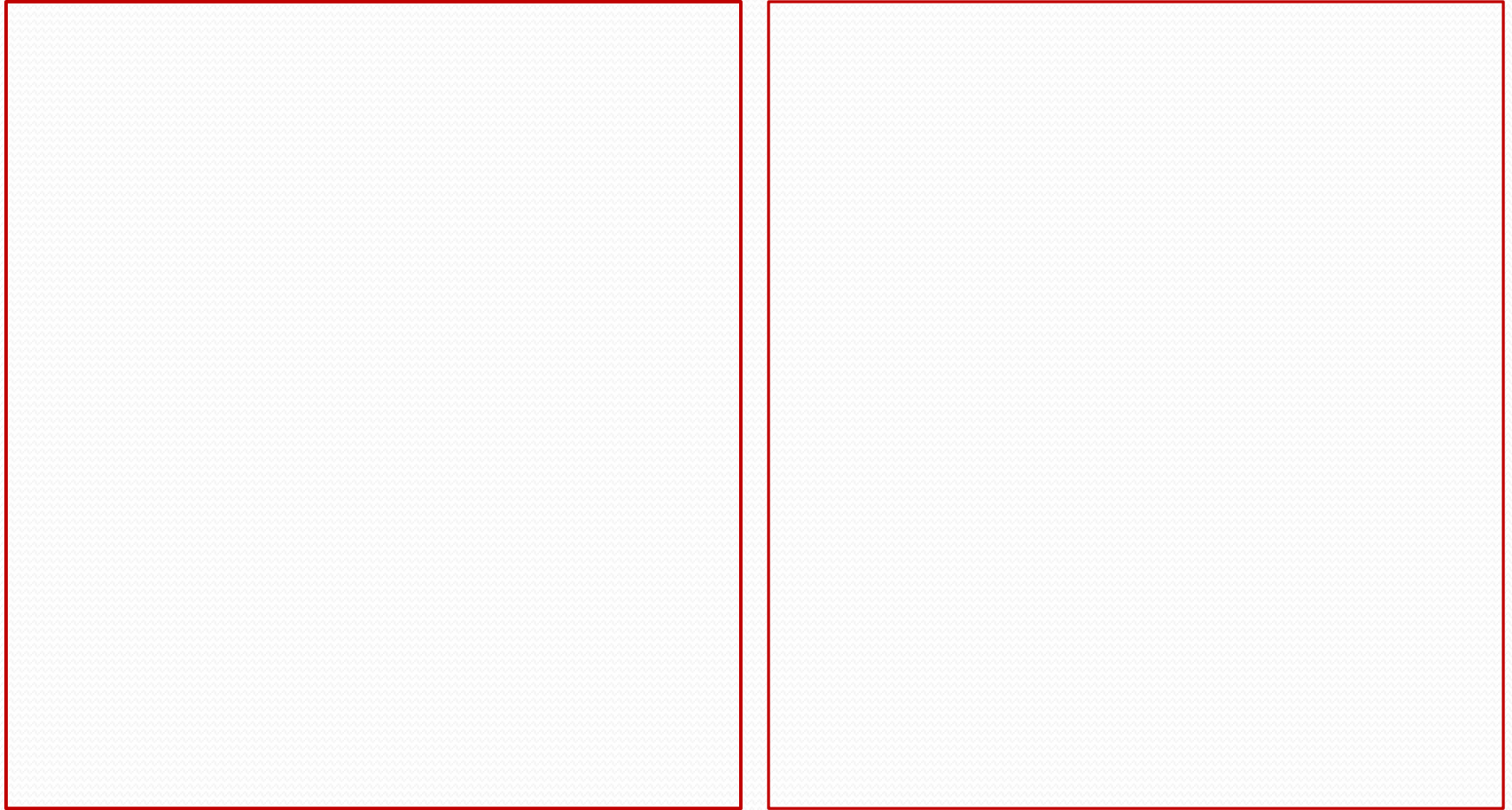
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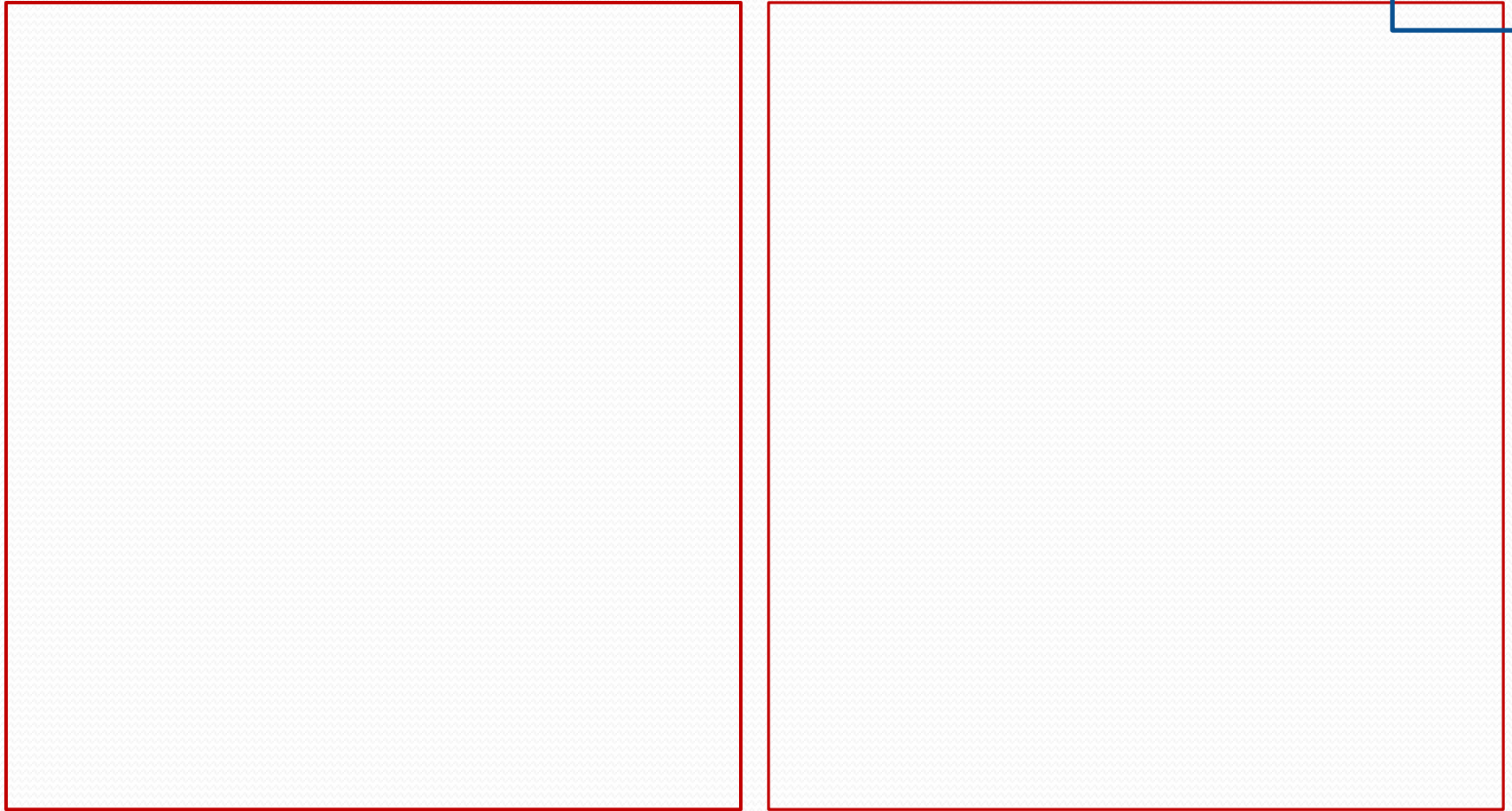
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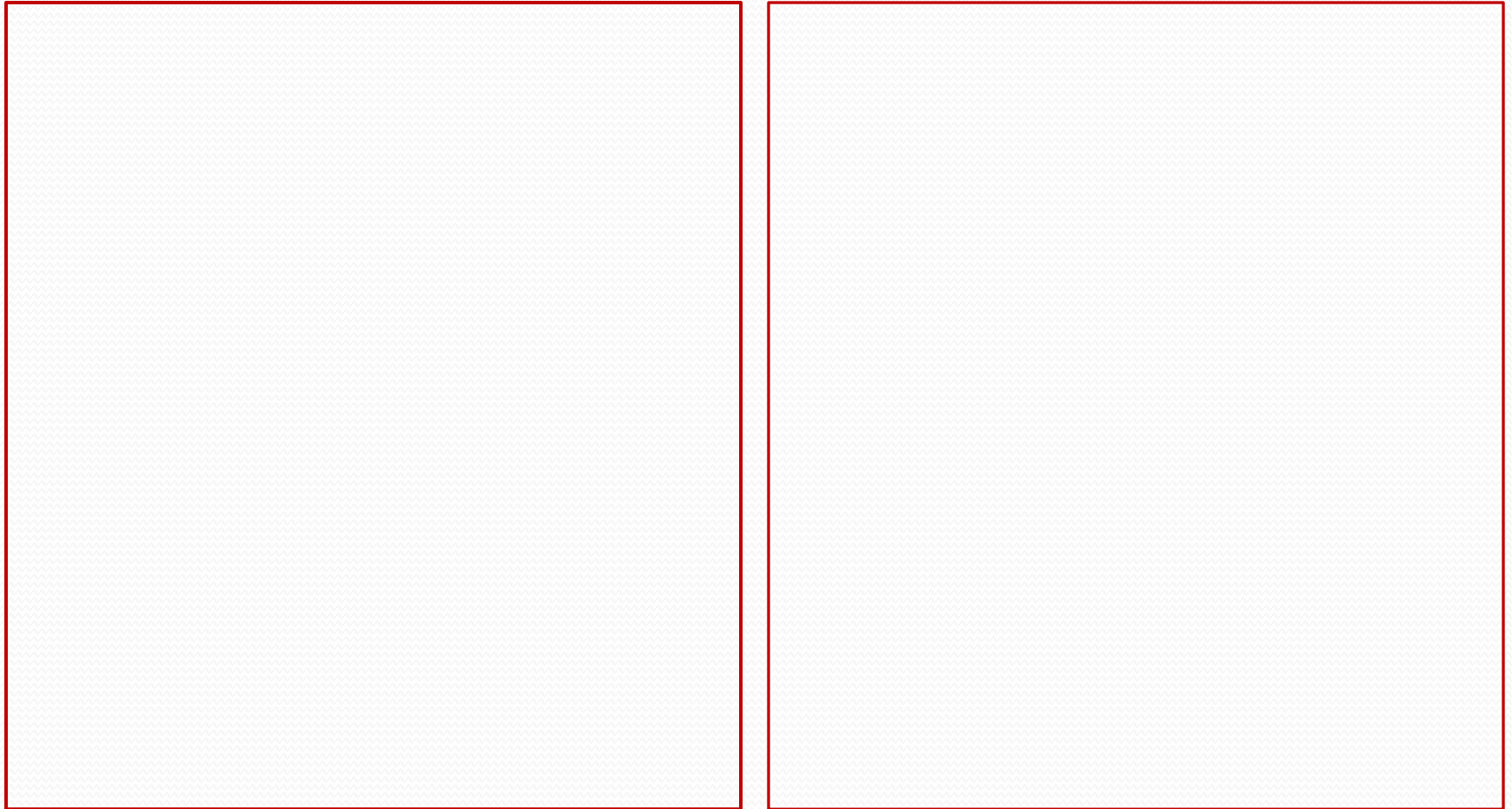
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Jet Track (Tracks included in the Jet for Final Jet Z)



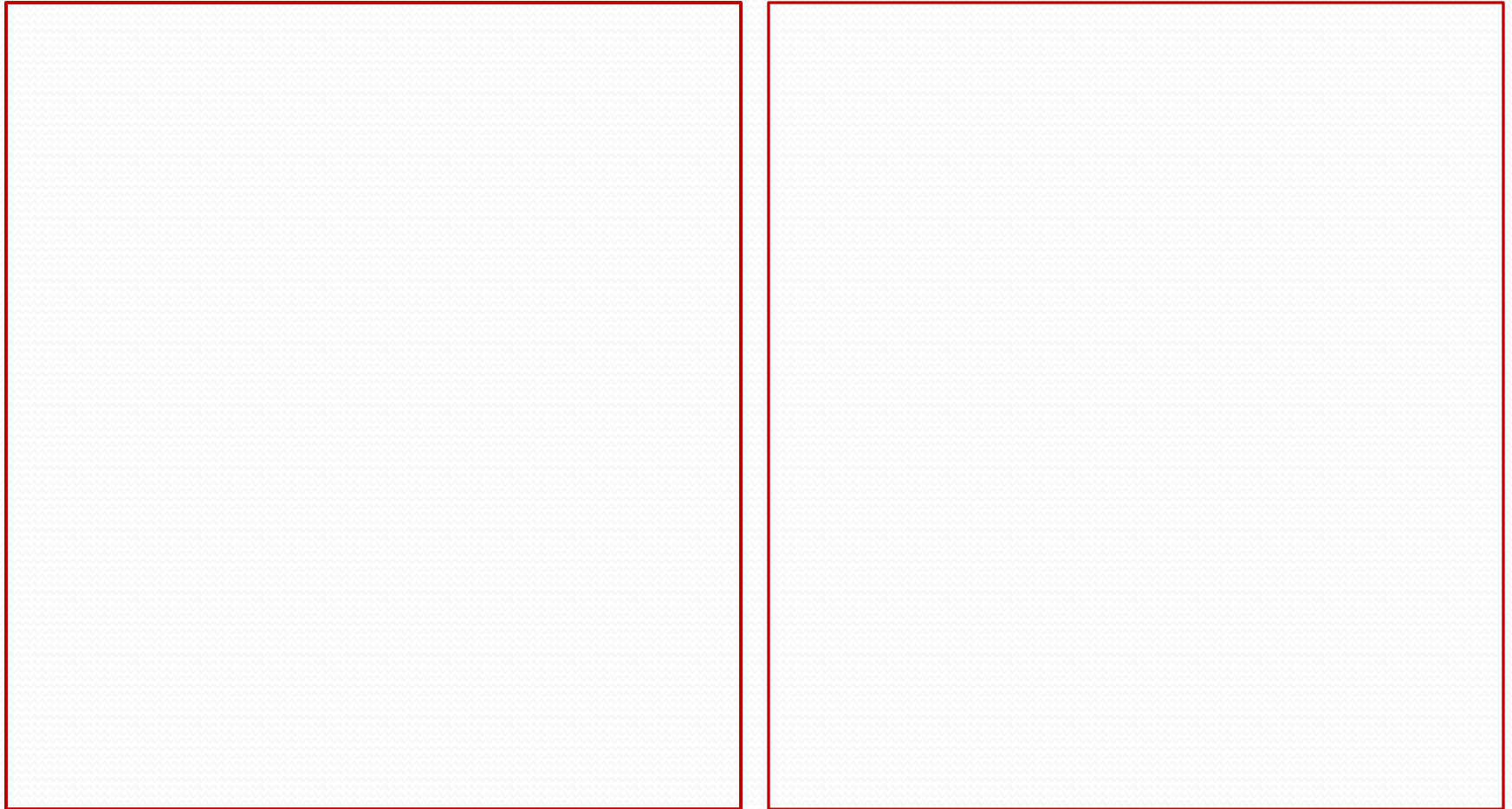
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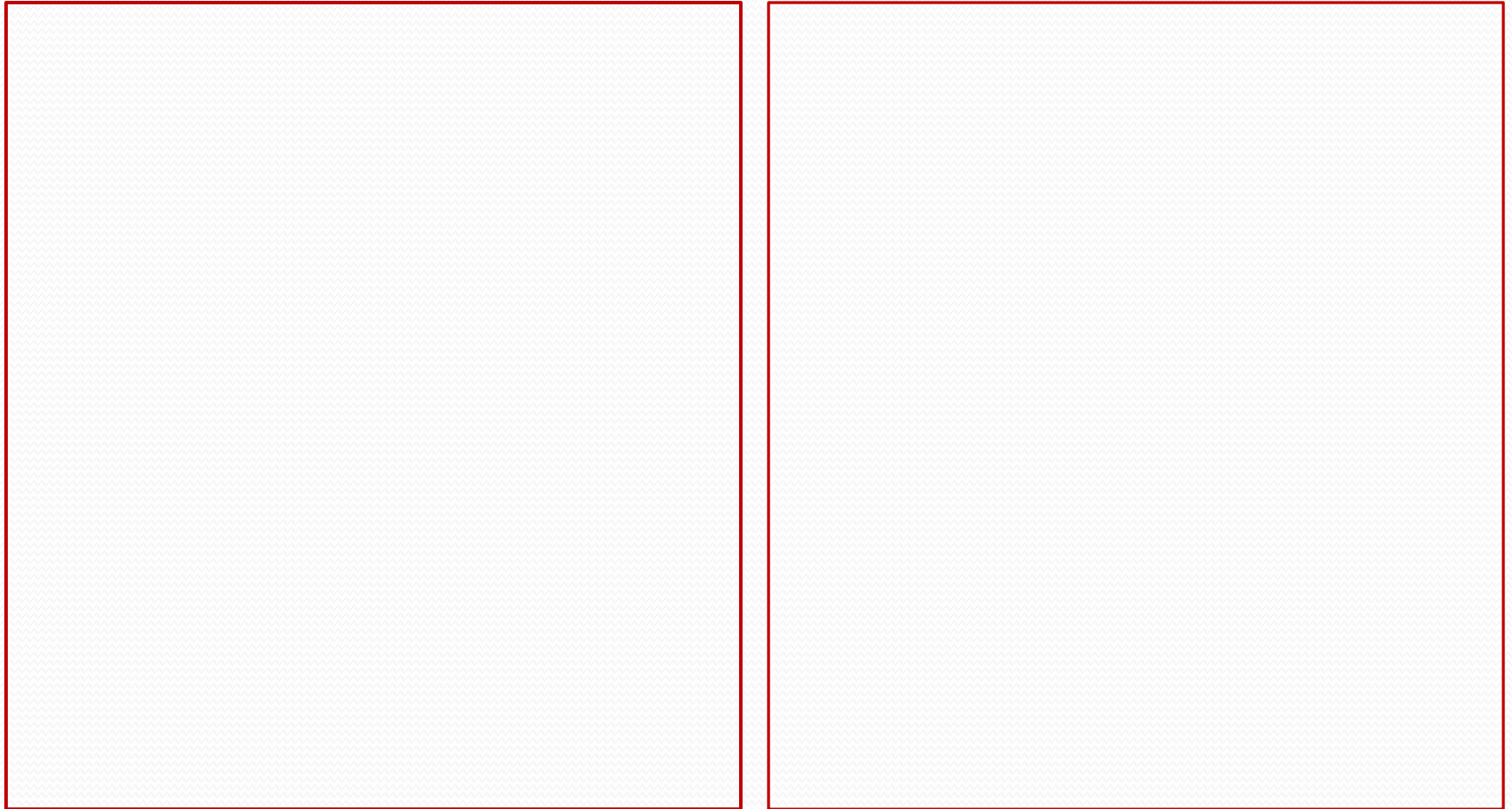
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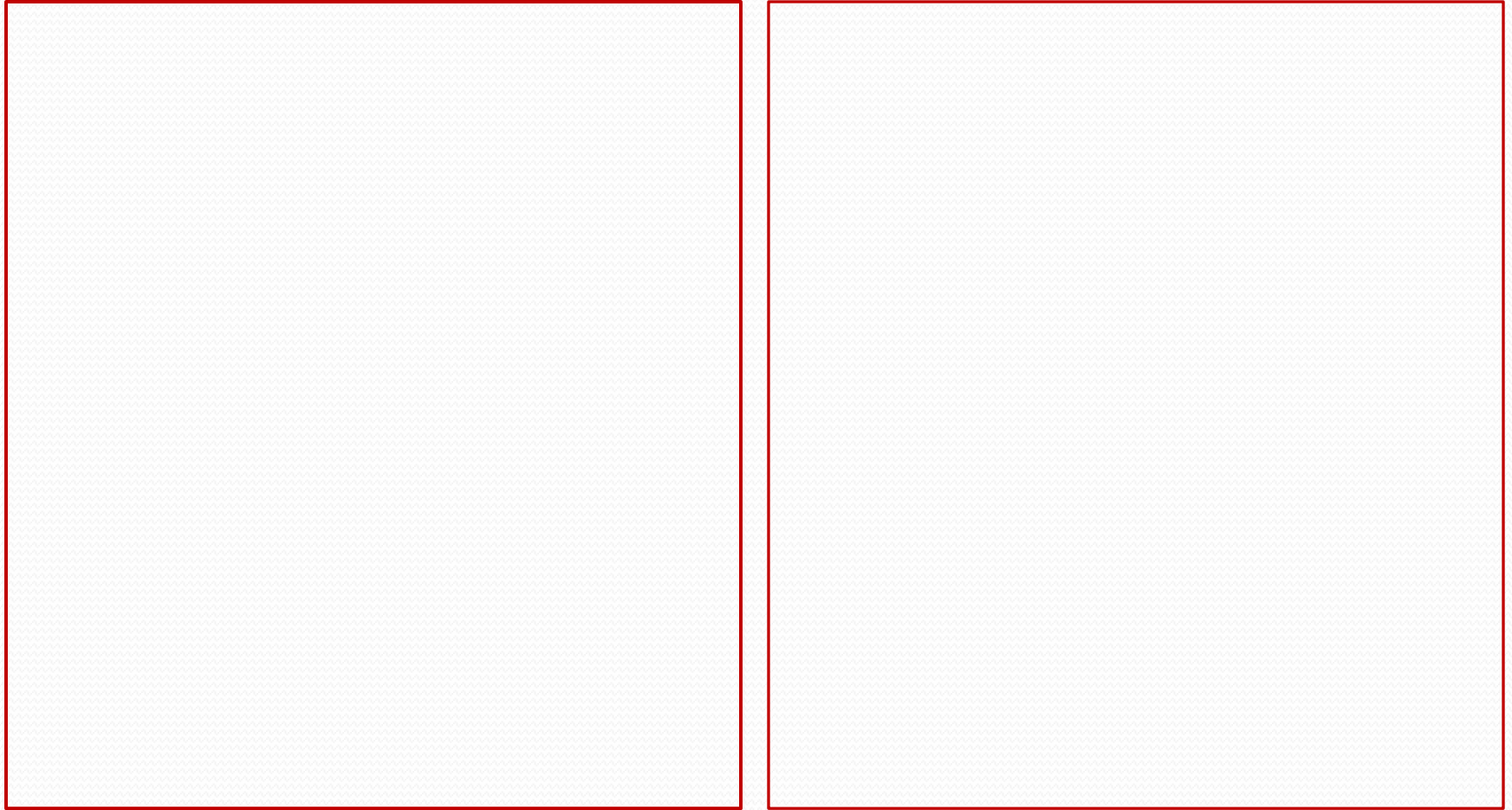
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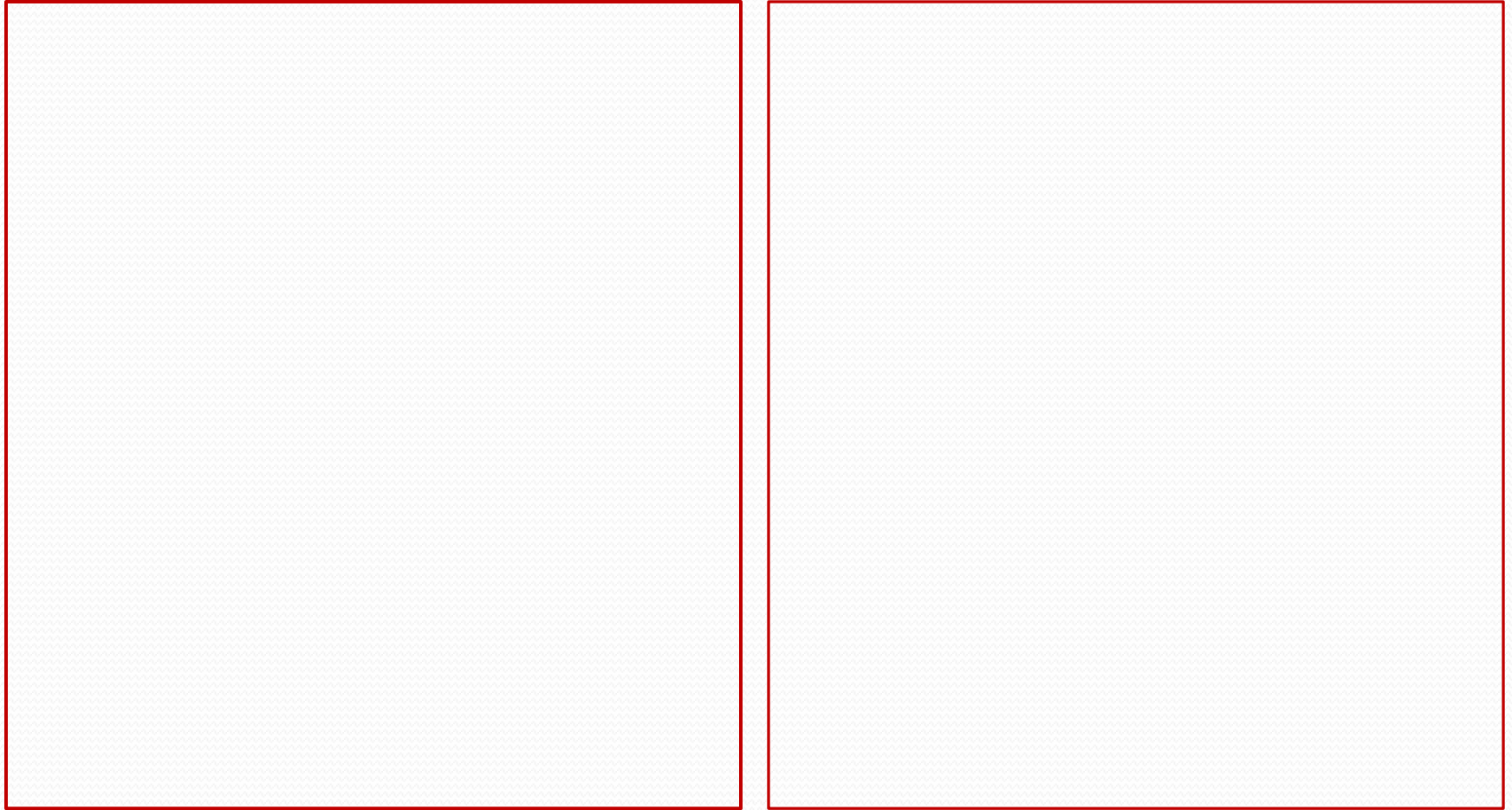
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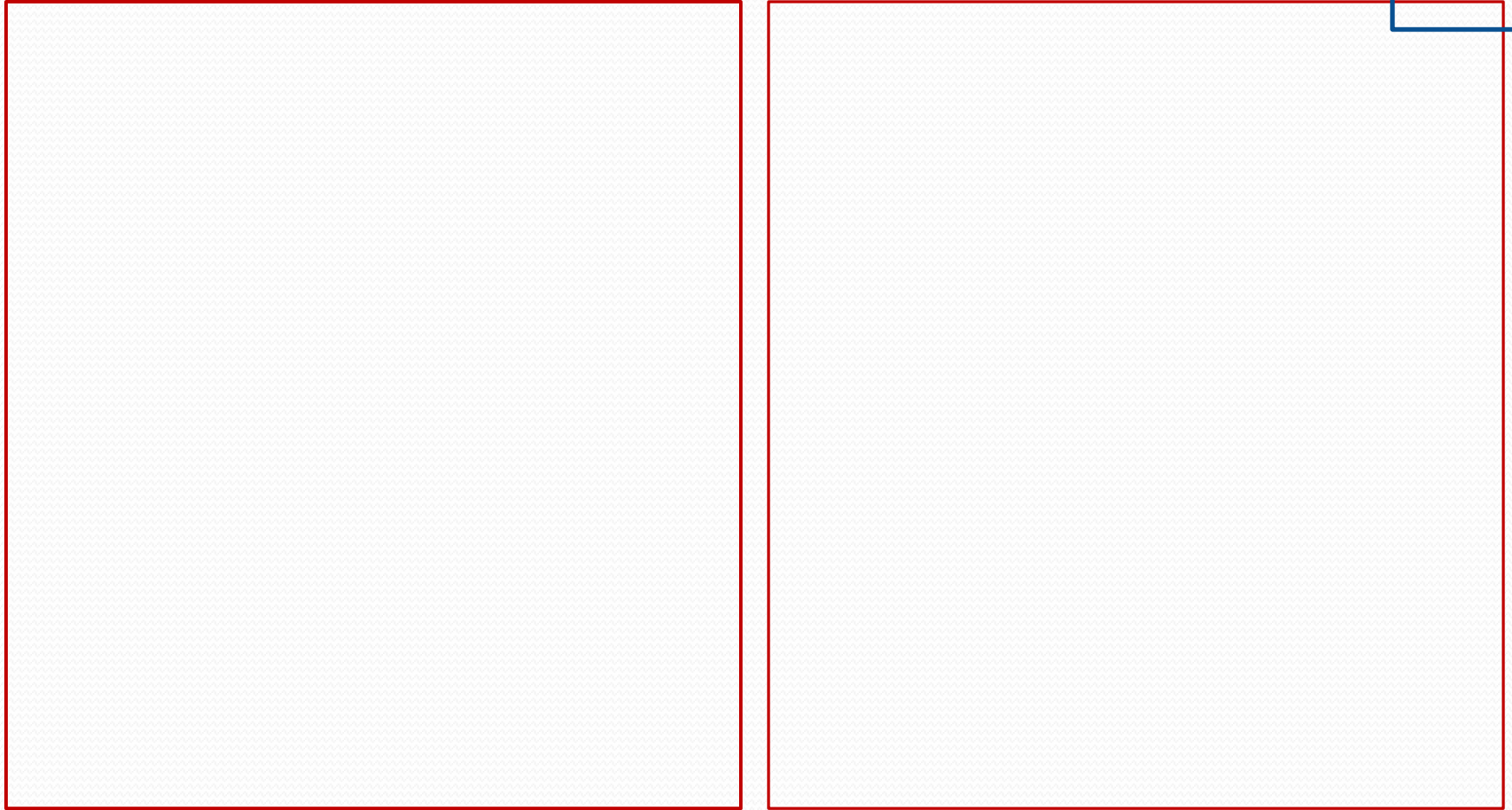
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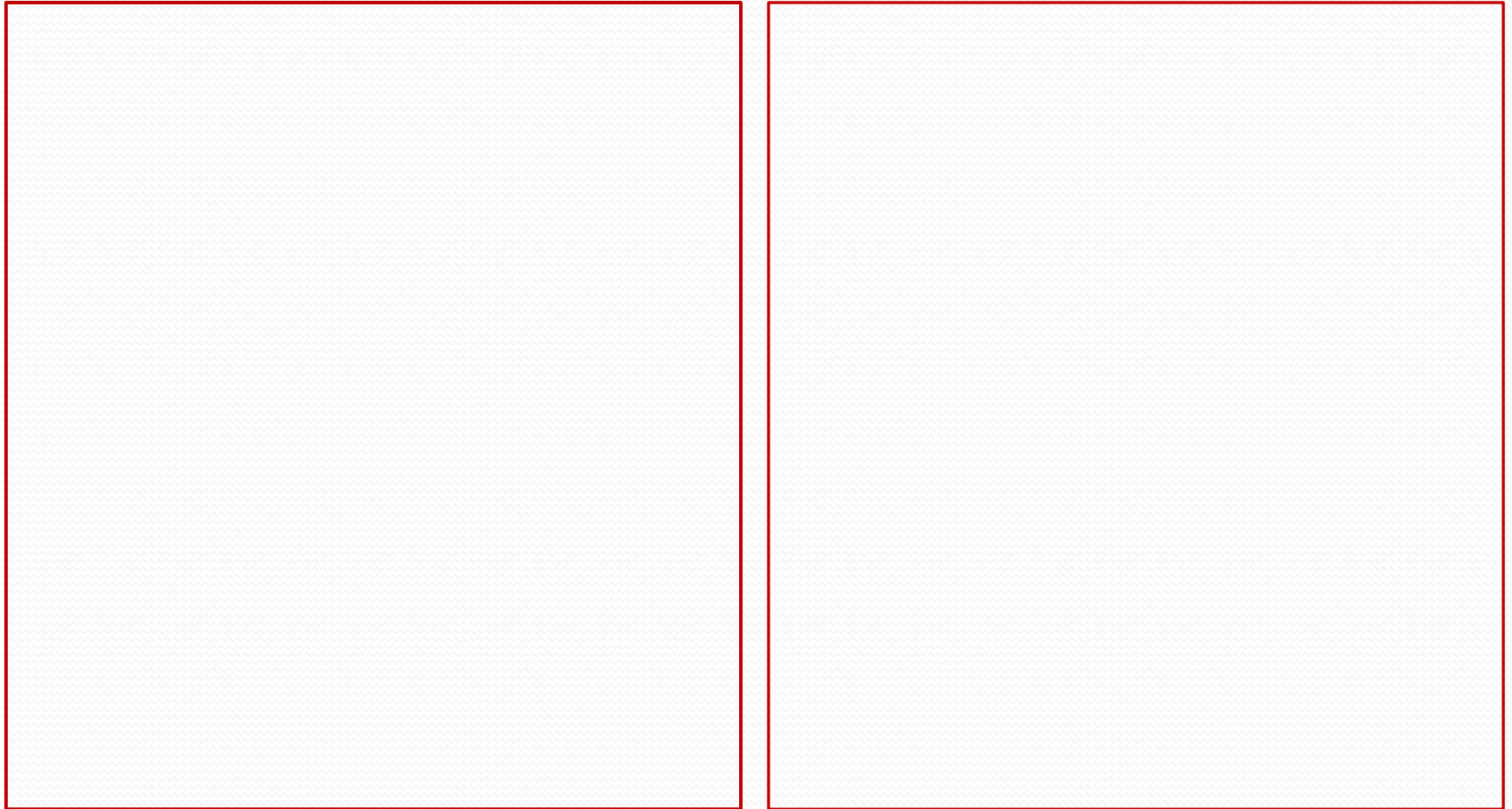
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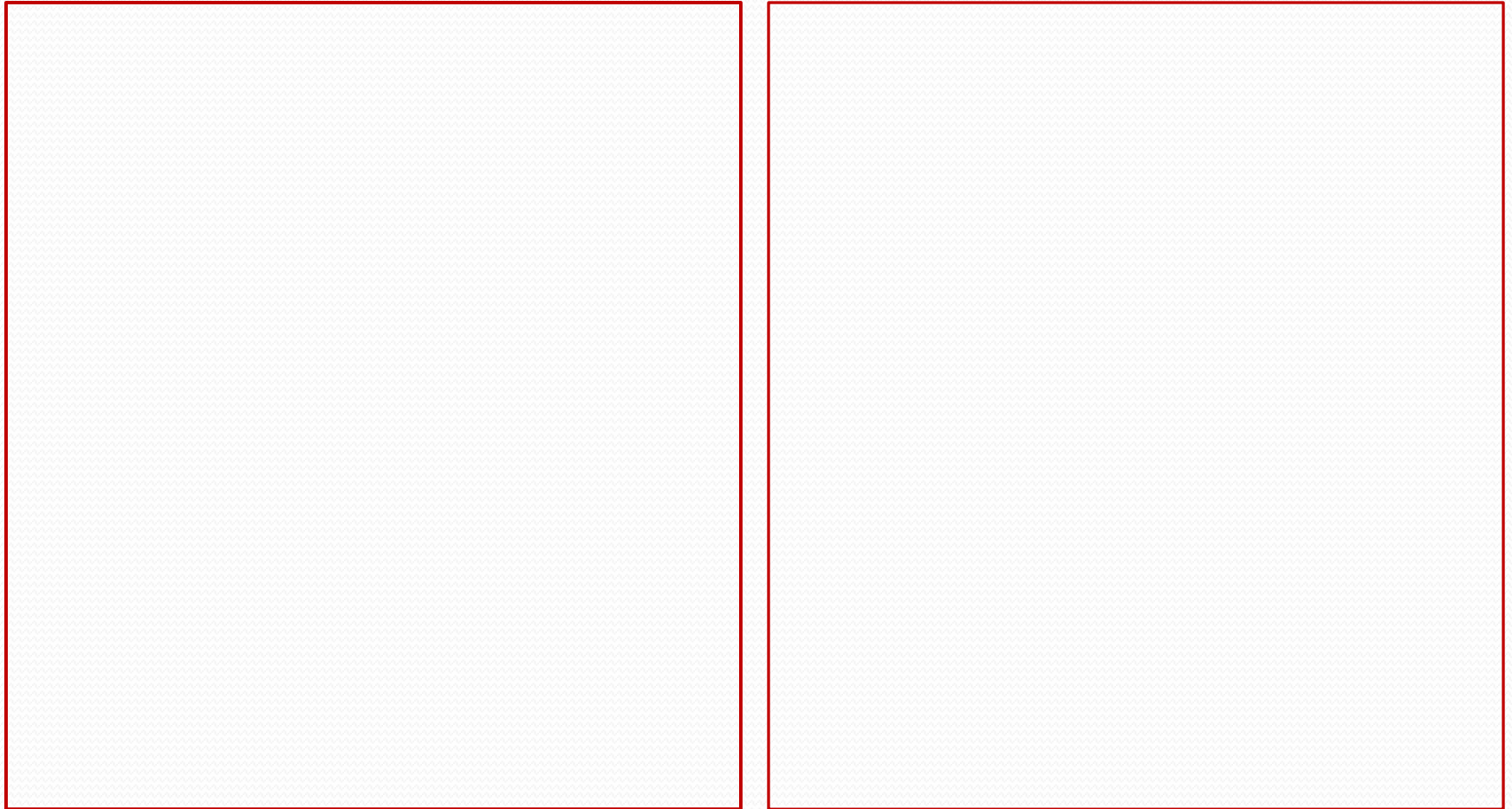
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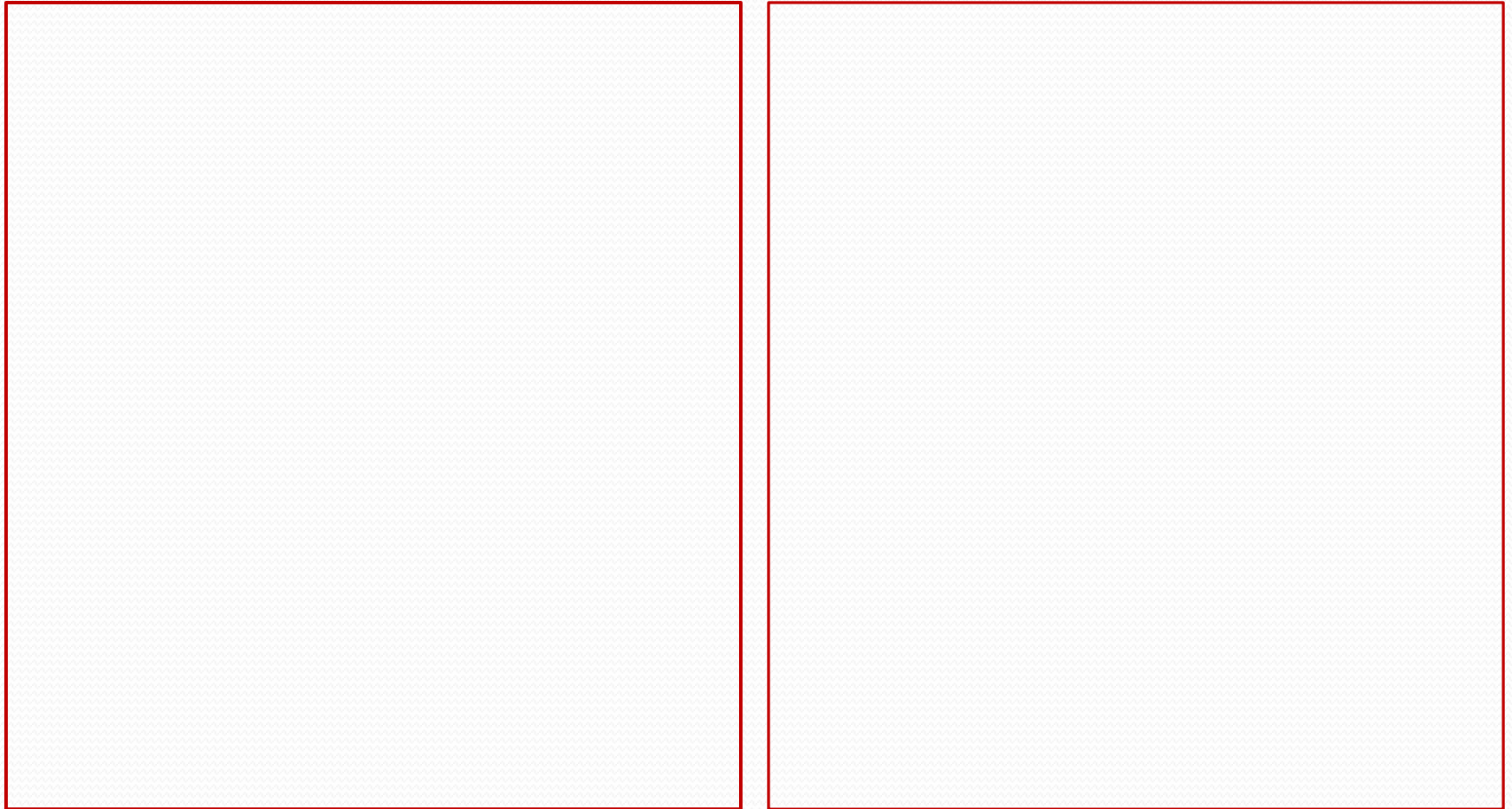
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