Scatter

Contents

List of Figures

1 Selection Cuts Leading Upto

1.1 Electron Track/Variables

Get the Electron Track Number and Electron Track Z Error using TMatrix55 .Select the Electron Track/Variables for Only Track 11 and all Tracks.Number of Entries-133384

Electron Track/Variables	Track Algorithm	Description
Electron Track Z Error	All	Ranges between 0.02 cm -0.07cm
	Only 11	Ranges between 0.02 cm -0.07cm
Electron φ	All	Track Phi0 is measured as Track Direction at point of Closest approach to Z axis
	Only 11	No change in the Sinusoidal pattern
Electron η	All	
	11	
Electron Track φ	All	Sinusoidal Pattern seen.
	11	
Electron Track η	All	More events in the Positive Central Region that the Negative
	11	

Table 1: Electron Track/Variables

1.2 Jet Tracks Selection

1.2.1 Jet Tracks associated at Ntuple level

Loop over the tracks in the Jet block and pick ones with Track Algorithm 11.Select only those events with atleast ONE Track-11 .Collect the track variables for only these events.Collect the track variables for the Leading,Second jet separately.

Calculate the Track Z error weighted average to get the Jet Z for both the jets.Use this Jet Z to obtain the Et-Weighted Jet Centroid (η,φ).

Use the Raw Collection of Track-11 Tracks collected above to apply the selection cut on the $\Delta Z/\Delta\varphi$ between the JetCentroid and Track-11 tracks.

Only events that have atleast ONE track tha passes the above $\Delta Z/\Delta\varphi$ for both the Leading and the Second jet are allowed.

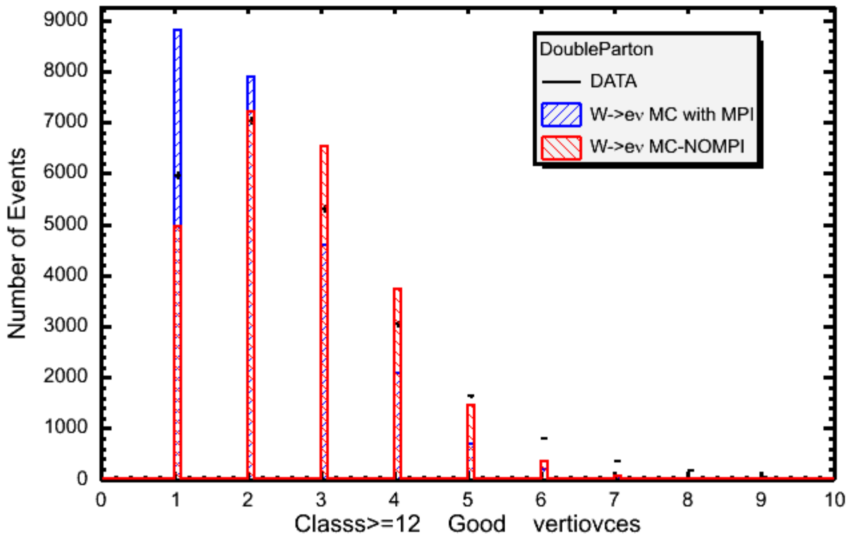

Figure 1: Number of Class>=12 Vertices

2 ΔZ(Electron-Track,Jet)<2*error on ΔZ(Electron-Track,Jet)

2.1 Class 12 Vertices Vs ΔZ/Δφ

2.2 Δφ(Leading/Second/Electron).

The Most importan dicriminating variable for the Identifying the signal from the Single-Vertex-W+2 Jet events

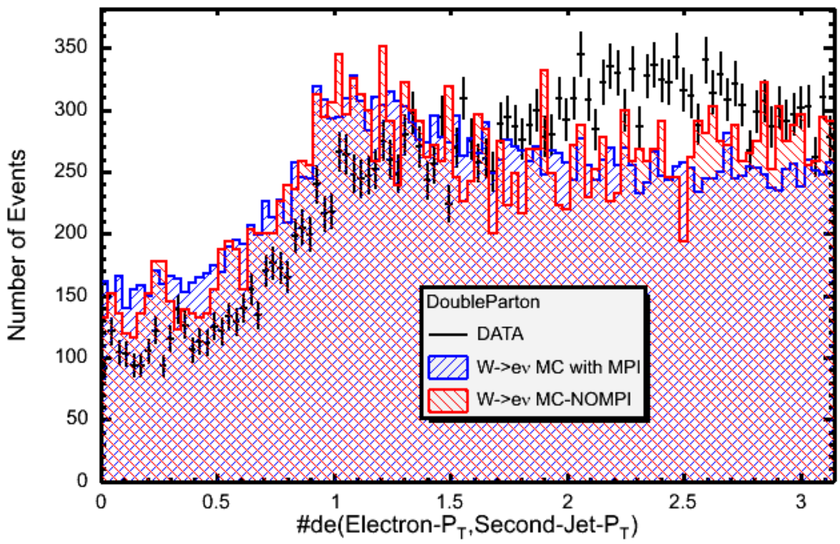

Figure 2: Δφ(Second,Electron)

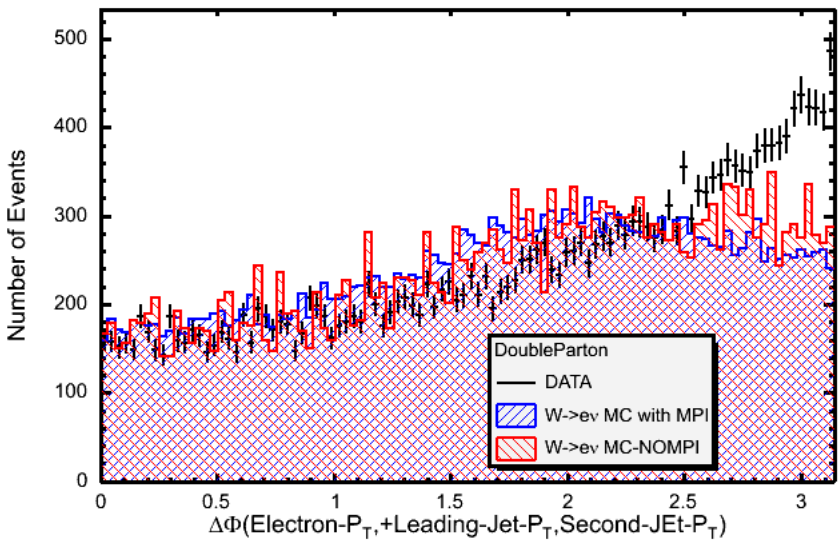

Figure 3: Δφ(Electron+Leading,Second)

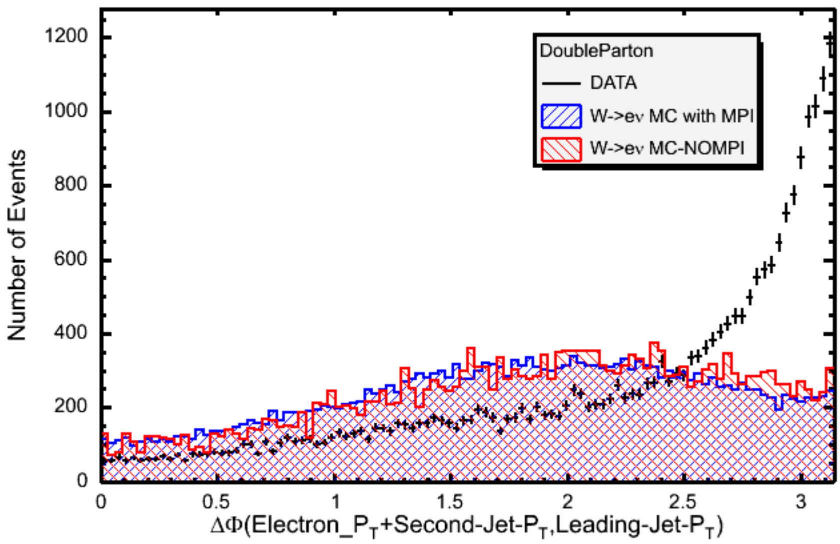

Figure 4: $\Delta\varphi$(Electron+Second,Leading)

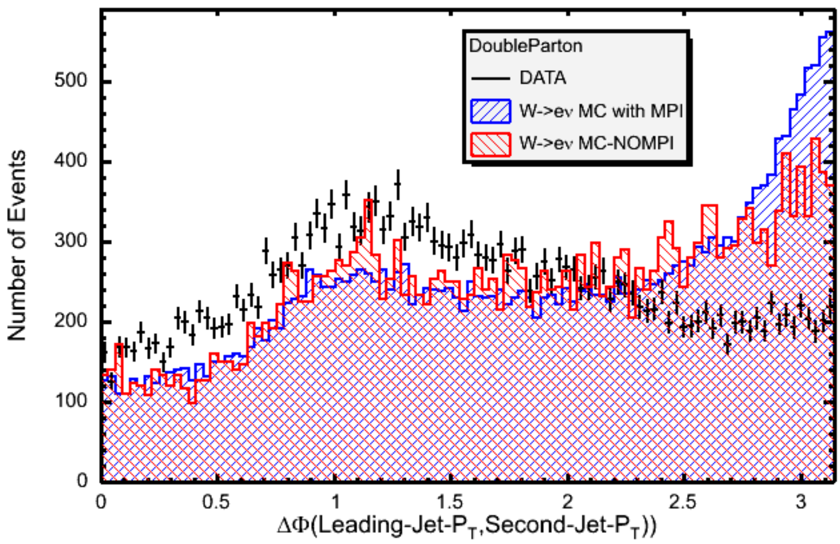

Figure 5: $\Delta\varphi$(Leading,Second)

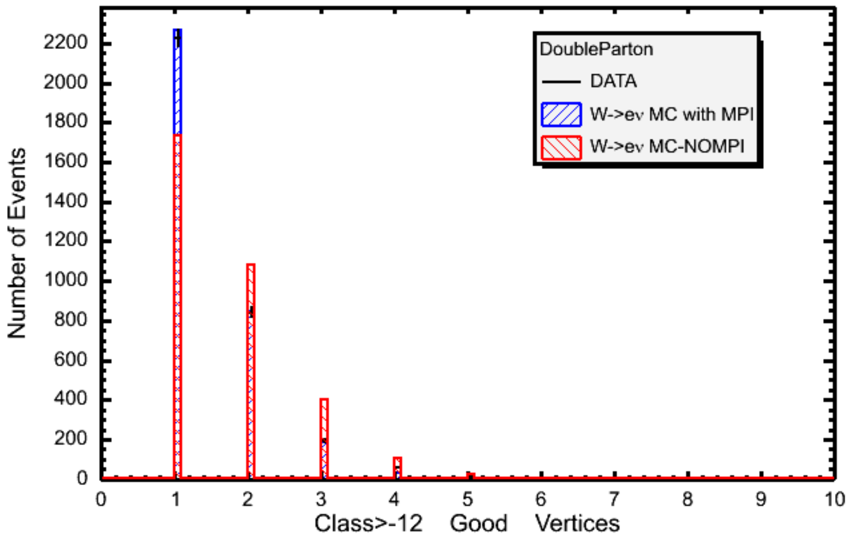

Figure 6: Number of Class>=12 Vertices

3 ONLY TWO Jets (With $E_T \geq 10$ GeV AND $|\eta|<2$) AND ΔZ(Leading,Electron-Track)<0.04 cm/ΔZ(Second,Electron-Track)<0.04

3.1 Class 12 Vertices Vs $\Delta Z/\Delta\varphi$

3.2 $\Delta\varphi$(Leading/Second/Electron)

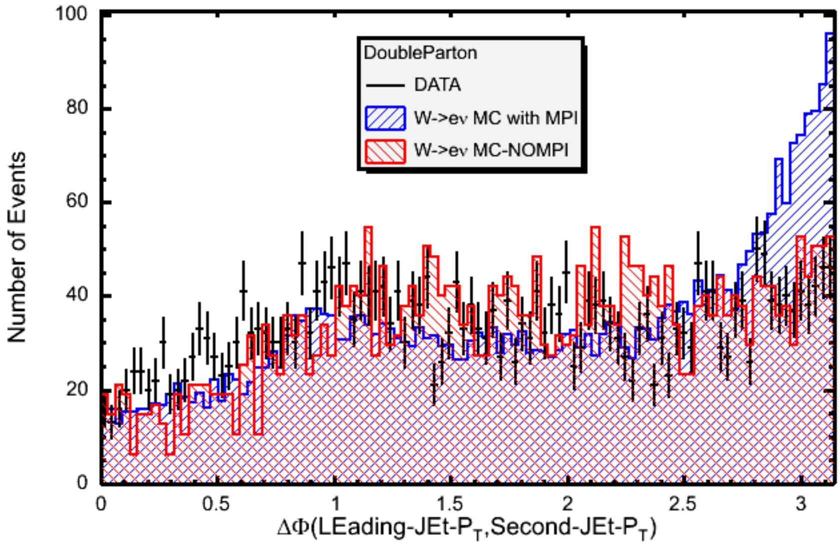

Figure 7: $\Delta\varphi$(Leading,Second)

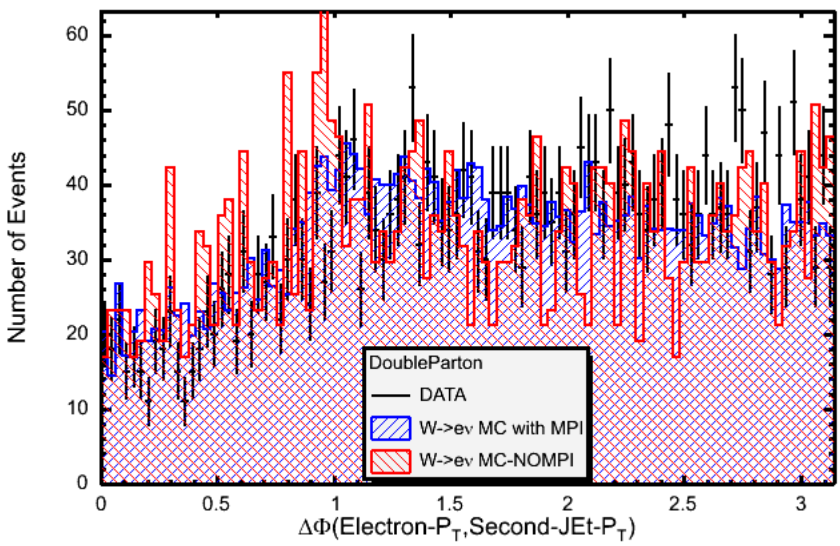

Figure 8: $\Delta\varphi$(Electron,Second)

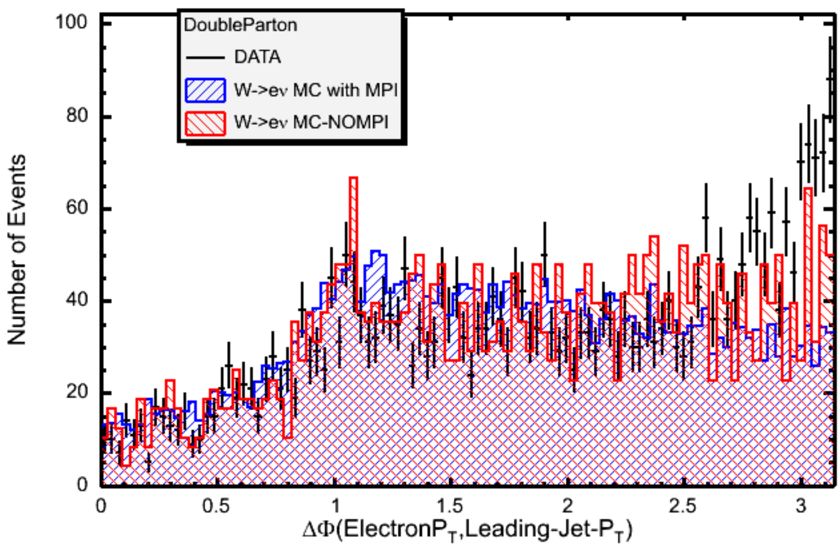

Figure 9: $\Delta\varphi$(Electron,Leading)

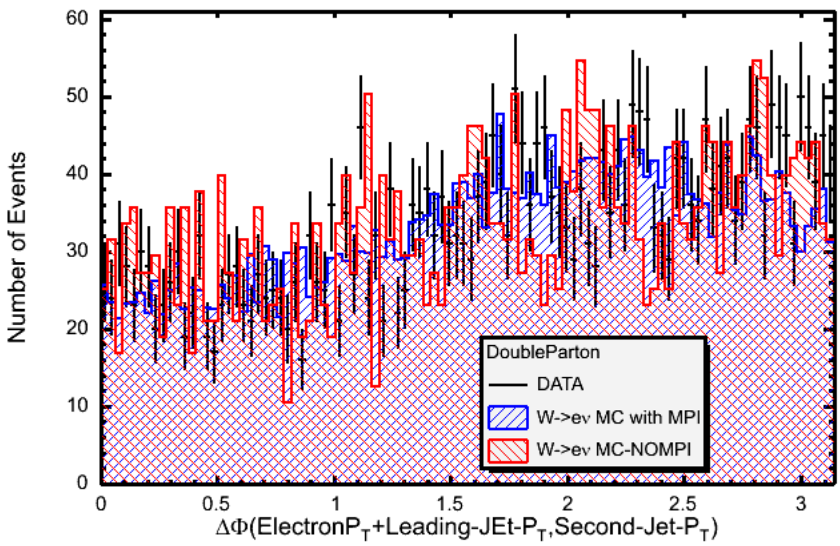

Figure 10: $\Delta\varphi$(Electron+Leading,Second)

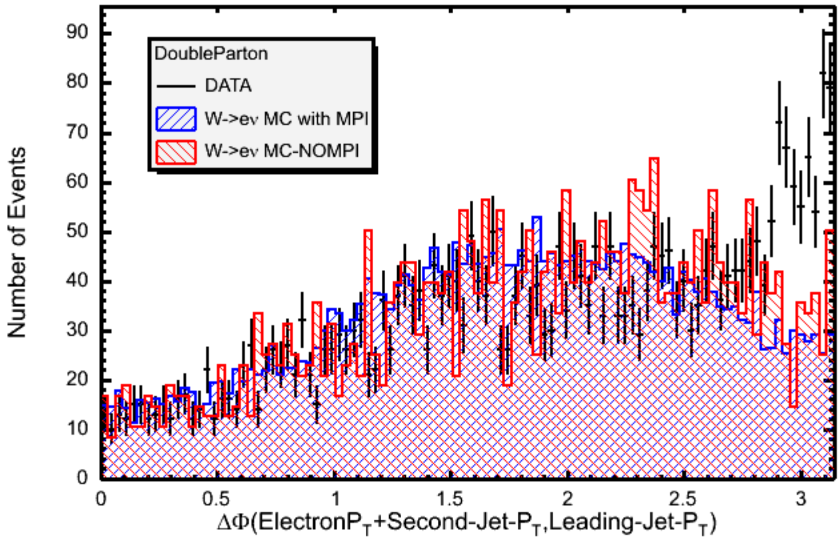

Figure 11: Δφ(Leading,Electron+Second)

4 ΔZ(Leading,Electron-Track)<0.04 cm/ΔZ(Second,Electron-Track)<0.04

4.1 Δφ(Leading,Second)>0 radians AND Δφ(Leading,Second)<1 radians

4.1.1 Δφ(Leading/Second/Electron)

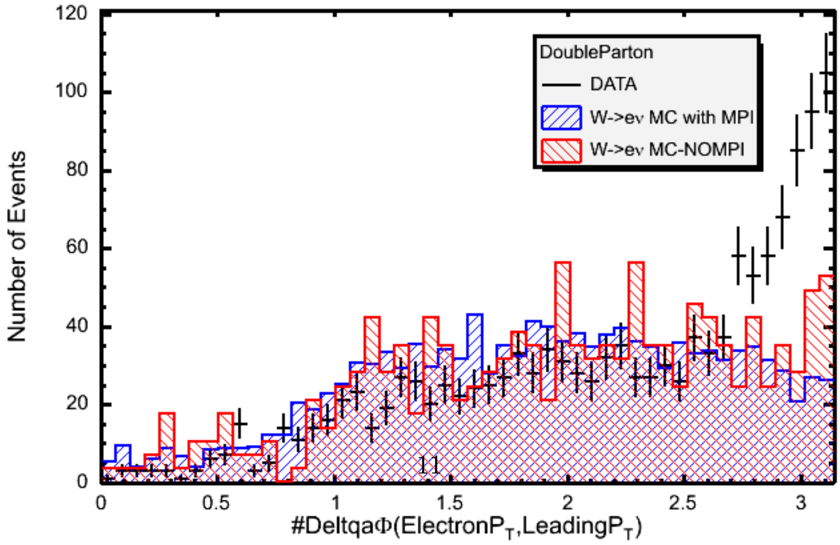

Figure 13: Δφ(Electron,Leading)

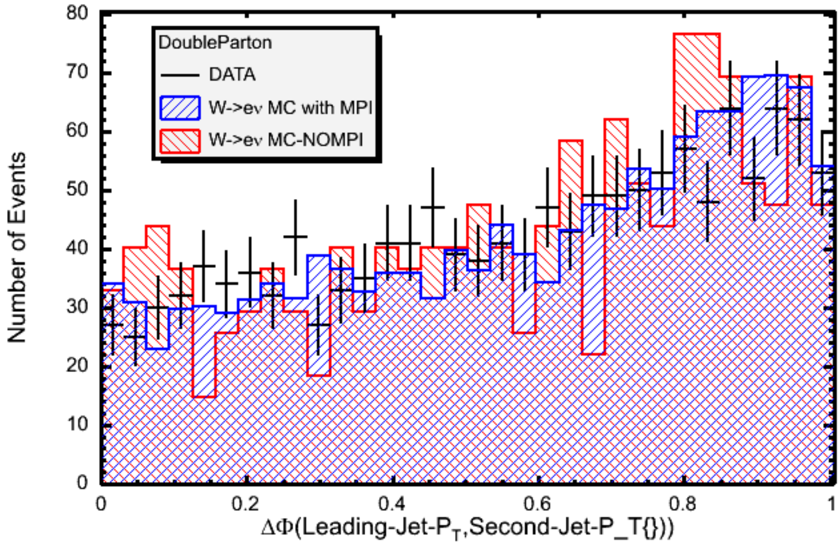

Figure 12: Δφ(Leading,Second)

4.1.2 Class 12 Vertices Vs ΔZ/Δφ

4.2 Δφ(Leading,Second)>1 radians AND Δφ(Leading,Second)<2 radians

4.2.1 Δφ(Leading/Second/Electron)

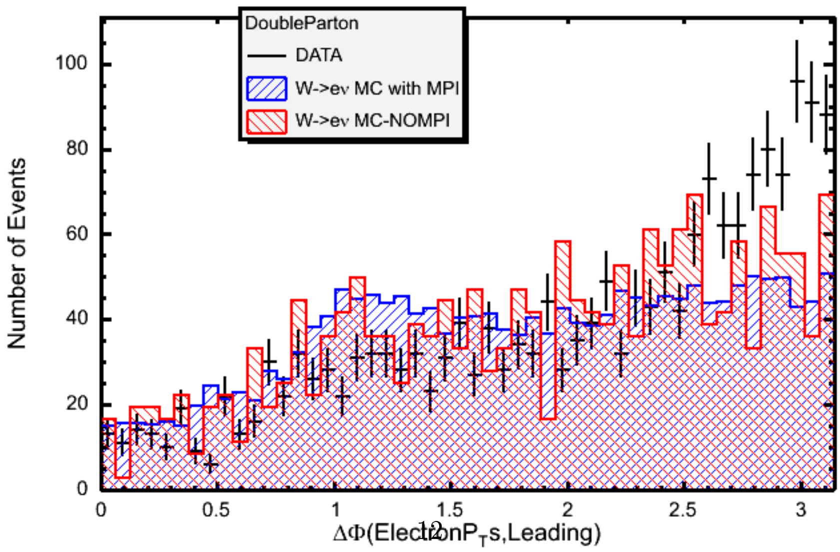

Figure 19: Δφ(Leading,Electron)

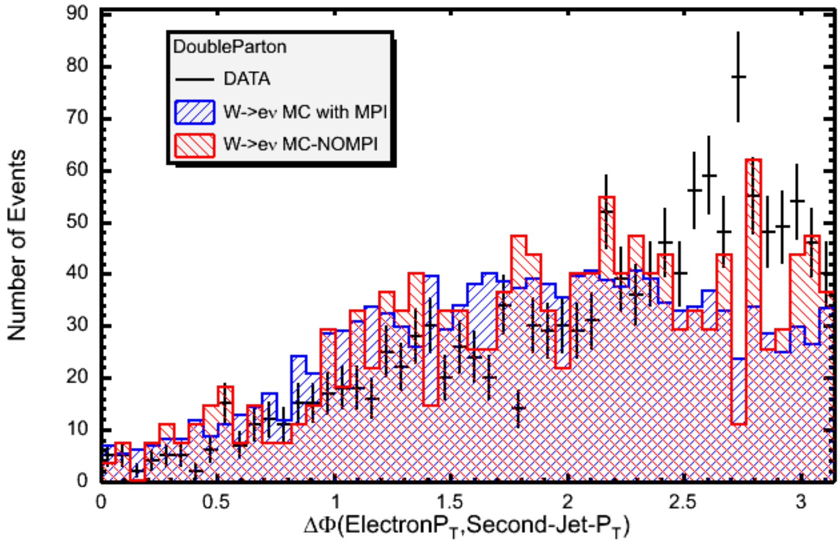

Figure 14: $\Delta\varphi$(Electron,Second)

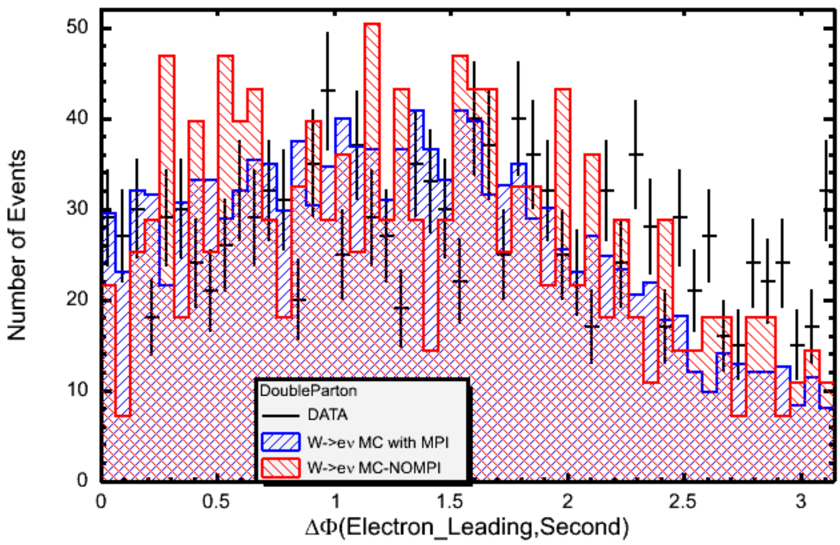

Figure 15: $\Delta\varphi$(Electron+Leading,Second)

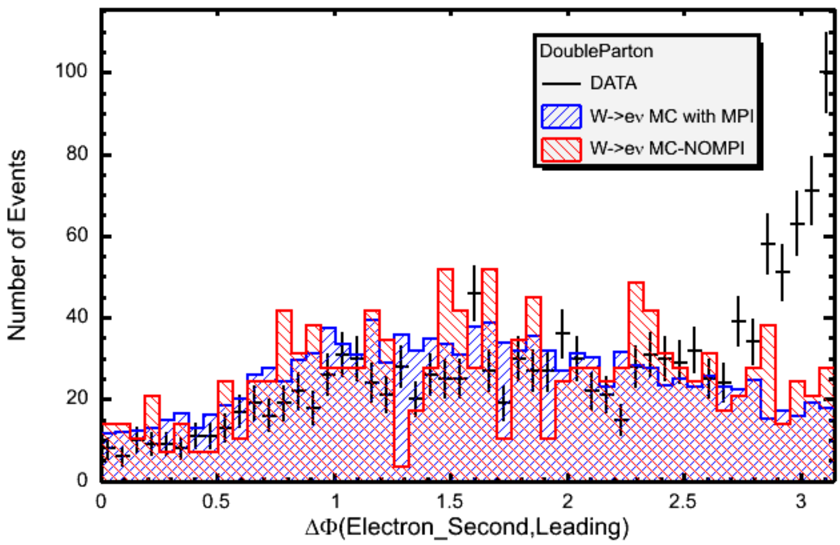

Figure 16: Δφ(Electron+Second,Leading)

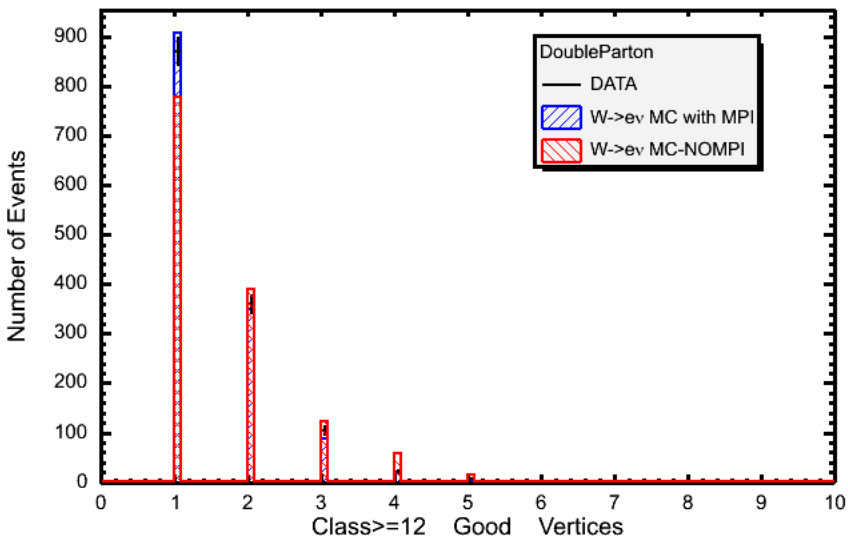

Figure 17: Number of Good Class>=12 Vertices

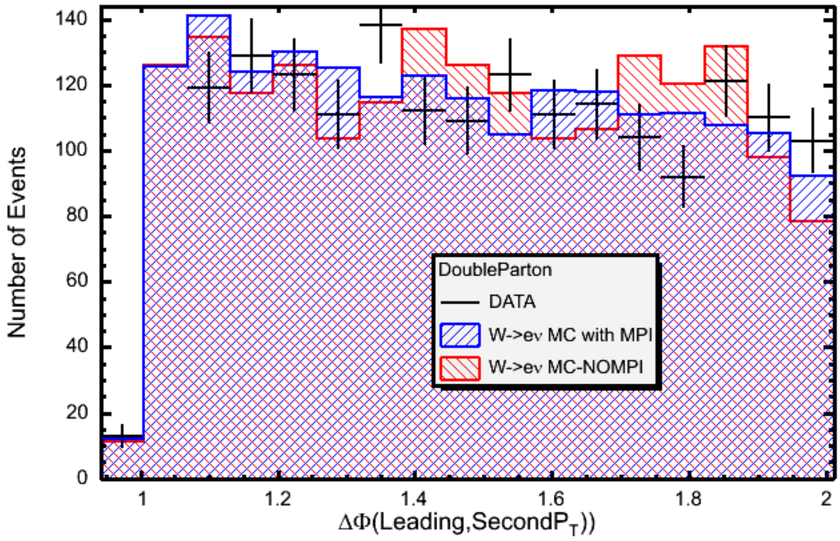

Figure 18: $\Delta\varphi$(Leading,Second)

4.3 $\Delta\varphi$(Leading,Second)>2 radians AND $\Delta\varphi$(Leading,Second)<PI radians

4.3.1 $\Delta\varphi$(Leading/Second/Electron)

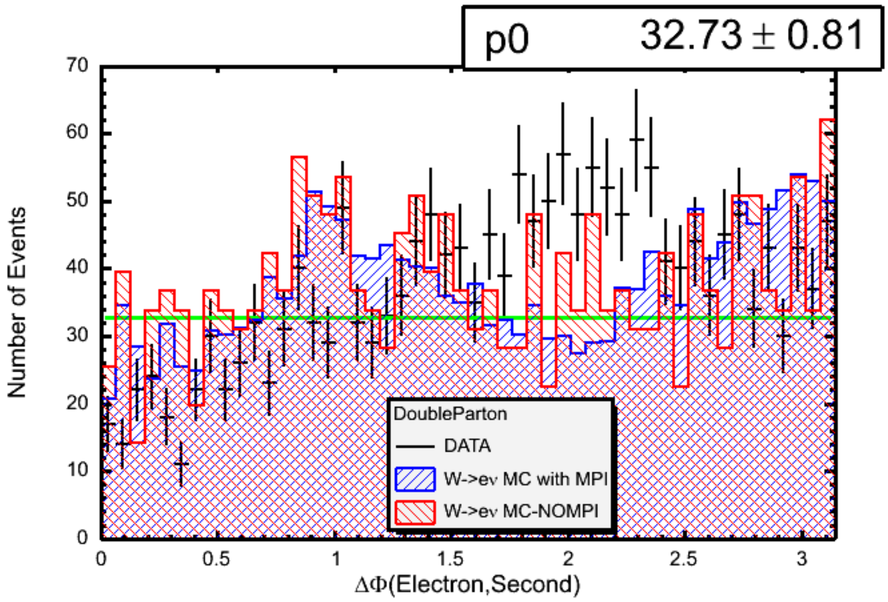

Figure 20: $\Delta\varphi$(Second,Electron)

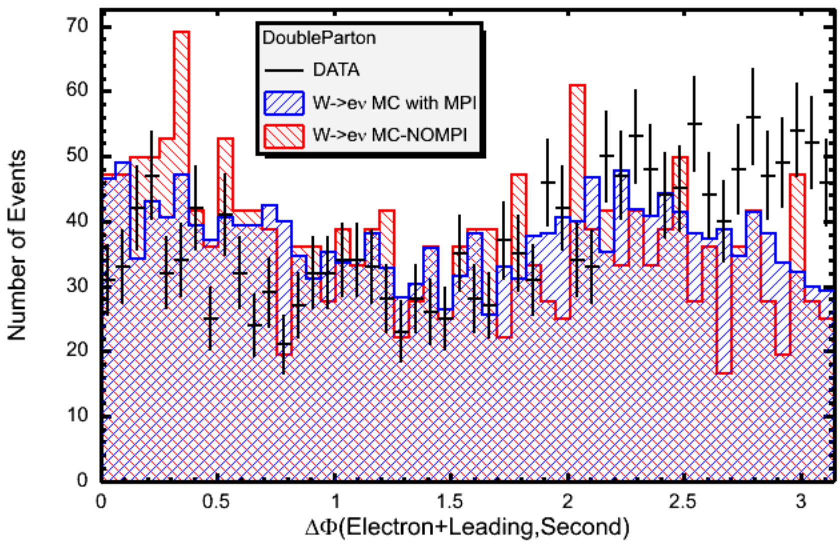

Figure 21: $\Delta\varphi$(Leading+Electron,Second)

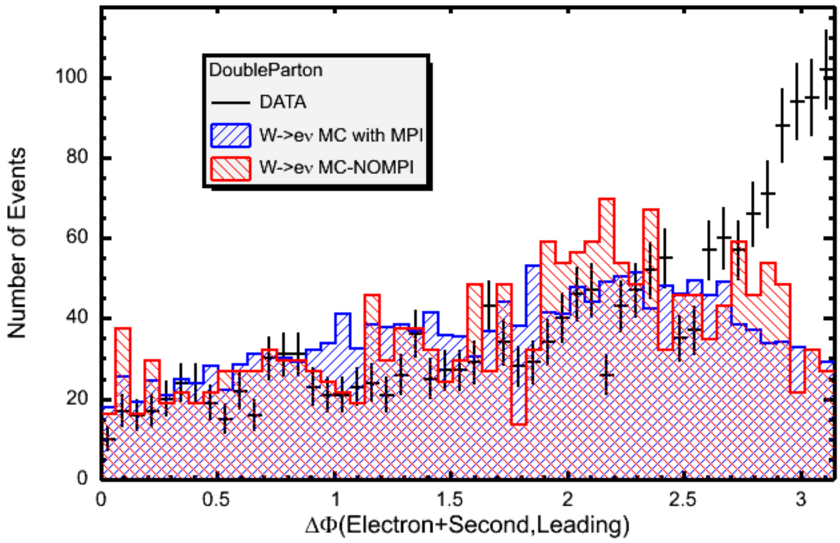

Figure 22: Δφ(Electron+Second,Leading)

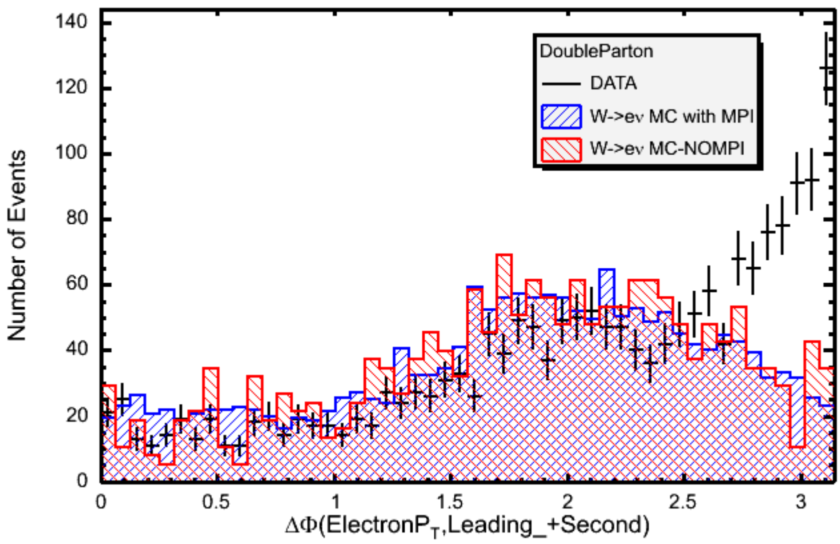

Figure 23: Δφ(Leading+Second,Electron)

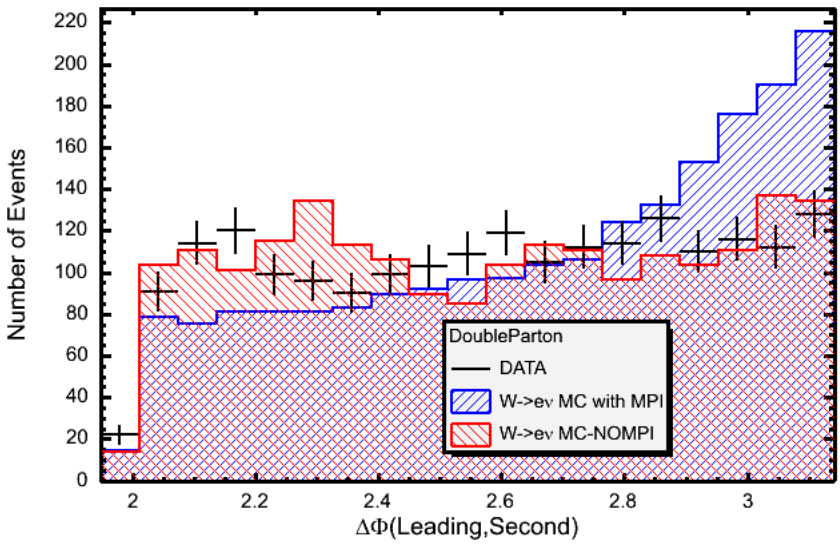

Figure 24: Δφ(Leading,Second)

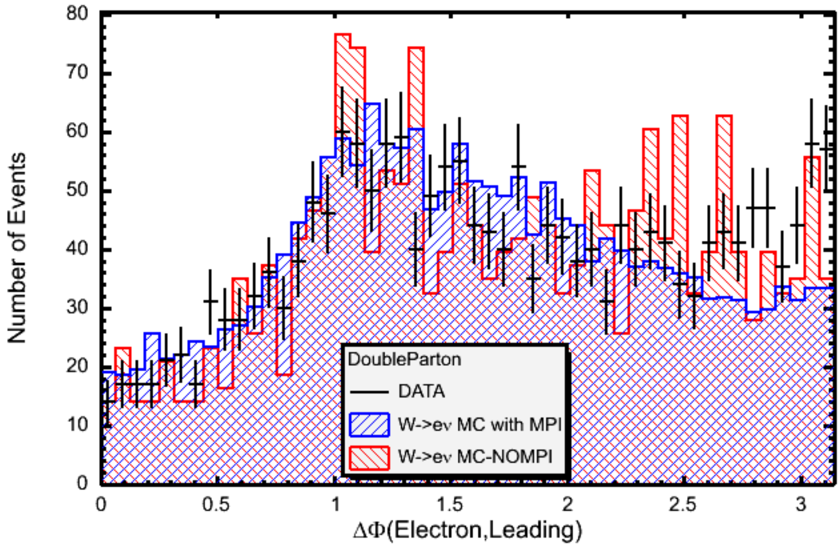

Figure 25: Δφ(Electron,Leading)

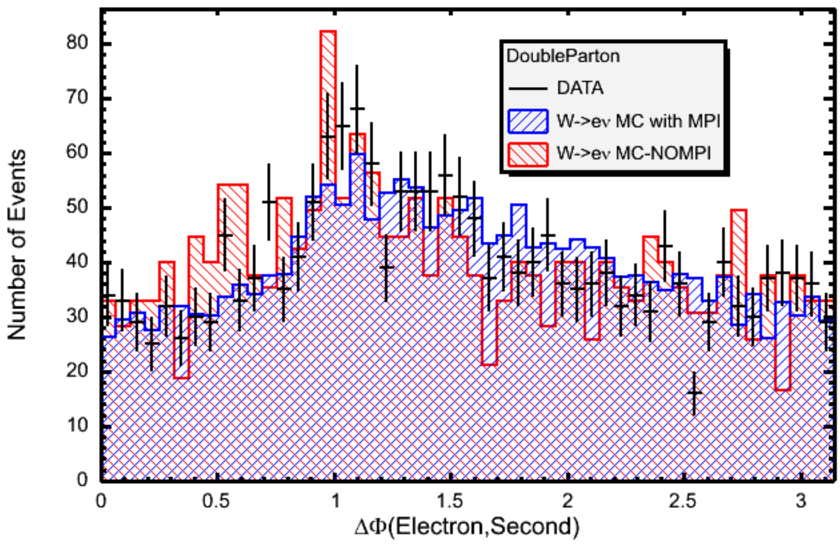

Figure 26: Δφ(Electron,Second)

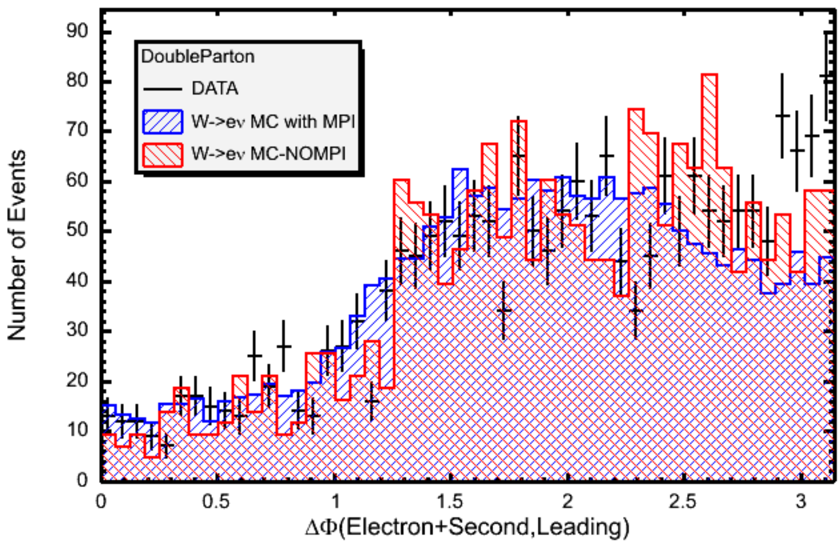

Figure 27: Δφ(Leading,Second+Electron)

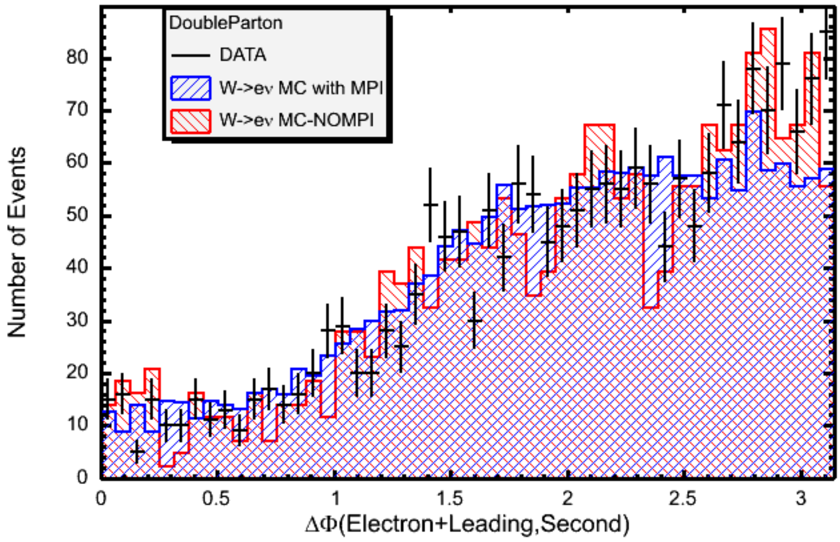

Figure 28: $\Delta\varphi$(Leading+Electron,Second)

5 Summary

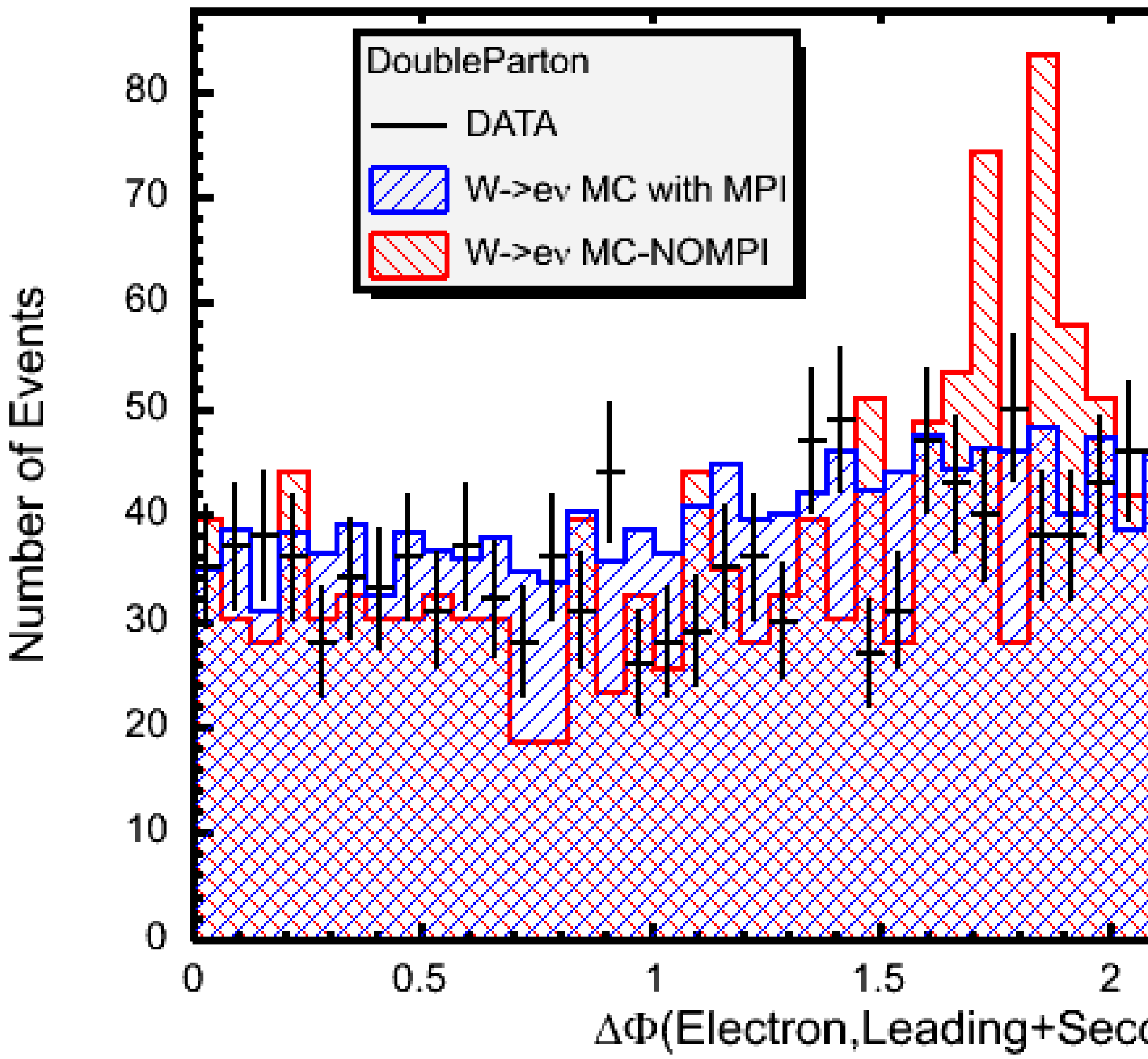

Figure 29: $\Delta\varphi$(Leading+Second,Electron)

Sections covered	Motivation	Summary/Observations
ΔZ(Electron,Jets)<2*Error-On ΔZ(Electron,Jets)	The 0.04 cuts used below were eyeballed from ΔZ(Electron,Jet) 1D plots.	• Found from 1D plots that can go as low as ΔZ(Electron,Jets)<0.02 cm too
ΔZ(Electron,Jets)<0.04cm AND ONLY TWO JETS	To Study the effect of the Third Jet with ET>10 Gev on the $\Delta\varphi$ plots	Eliminates the third jet
ΔZ(Electron,Jets)<0.04cm+$\Delta\varphi$(Leading,Second) - [0-1]	Small Angle between the Leading and Second can signify either a Single-W+2 Jets event OR Getting balanced ny a third jet in a Three-jet event	Single Vertex Background
ΔZ(Electron,Jets)<0.04cm+$\Delta\varphi$(Leading,Second) - [1-2]	It is flat ==> Uncorrletaed Leading and Second Jet,But need to understand their correlation with the Electron-MET system	
ΔZ(Electron,Jets)<0.04cm+$\Delta\varphi$(Leading,Second) - [0-1]	Leading/Second are backto back with each other.Signifying Double Parton events with a Dijet-(Electron-MET)	Ideal for Double Parton Events

Table 2: Summary