

CohJ/ ψ Analysis (**OS- $\mu\mu$**)(**DC**)(**2-track**)

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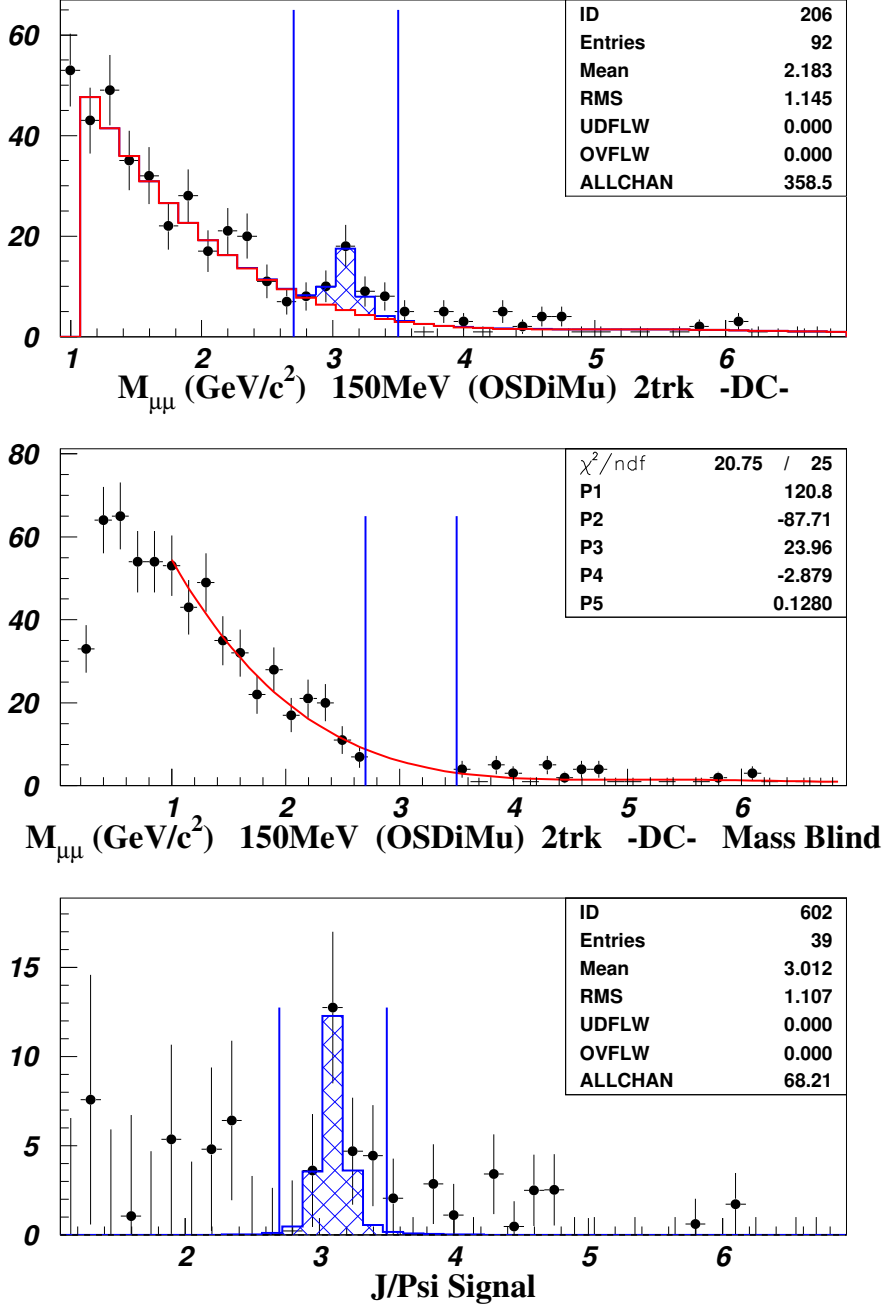
1 Zeroth Norms

	Gen Number	Zroth Norm
CCDIS	4116629.0	1440000.0
	2451852.2	547200.0
	337363.3	29.6
JPsi	409103.8	10000.0
	147680.4	7380.1
	384881.8	36000.0
OBG	418257.5	32000.0
	179844.8	5000.0
CohPi+	396271.9	21600.0
	193616.5	2160.0
CohRho+	189598.9	13680.0
	25235.8	1000.0
aNuMu CC	934139.8	50400.0
	4075.9	200.0
QE	4500.0	100.0
	4500.0	100.0
CohPi0	4500.0	100.0
	4500.0	100.0
Nue CC	4500.0	100.0
	4500.0	100.0
aNue CC	4500.0	100.0
	4500.0	100.0
aNuMu NC	824186.4	2000.0

Table 1: Generated Number of MC Events

Extra Normalizations:

- * Coh π^+ : 0.985 (From 2V0 analysis)
- * Coh π^0 : 0.985 (From 2V0 analysis)
- * Coh ρ^+ : 0.669 (From CohRho0 measurment)
- * Coh ρ^0 : 0.669 (From CohRho0 measurment)
- * OBG: 0.22 (from CohRho0 analysis)

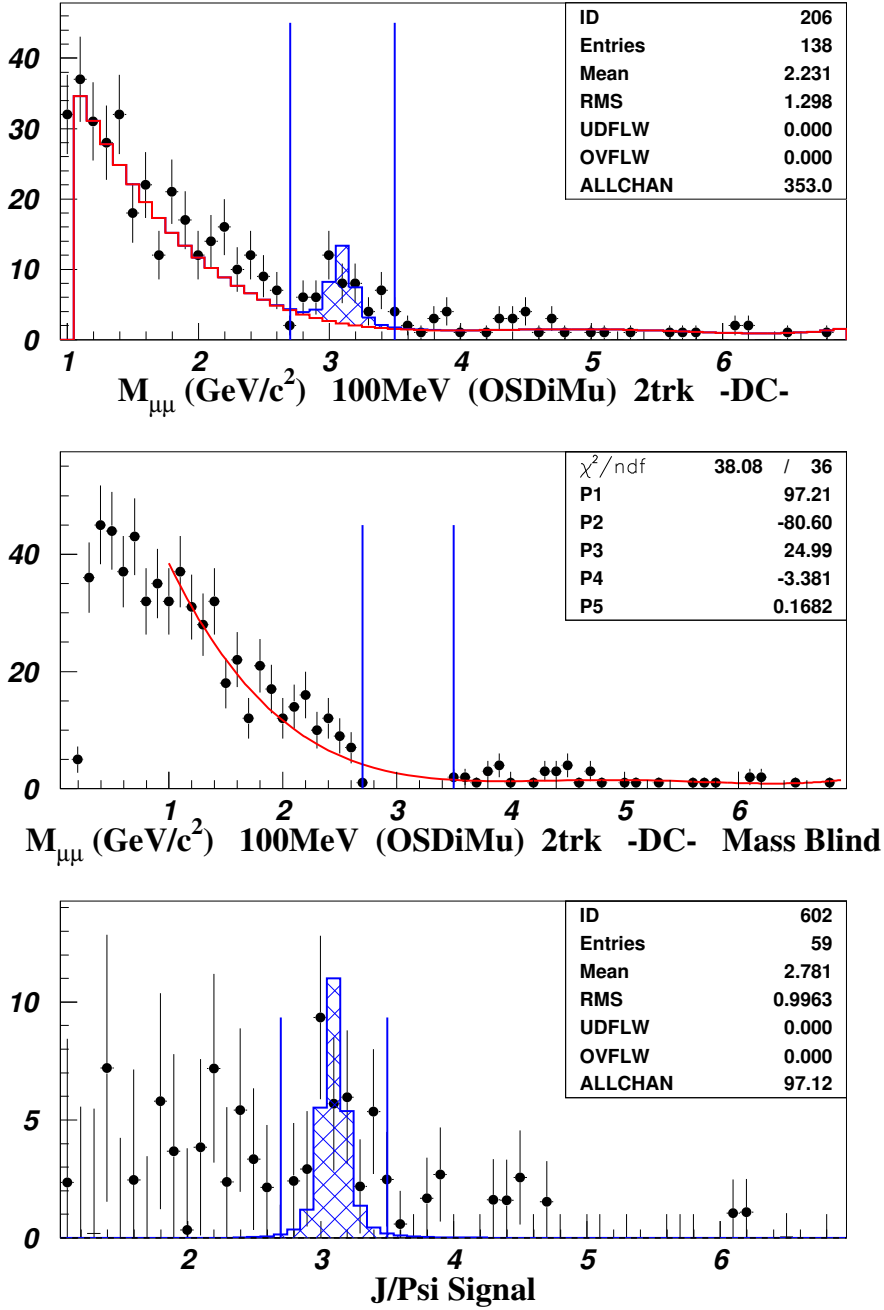


Signal range	2.72-3.47
Number of signal	25.73
Background	27.27
Statistical error	7.28
Significance	3.53

Signal range	2.87-3.32
Number of signal	21.05
Background	15.95
Statistical error	6.08
Significance	3.46

Signal range	3.02-3.17
Number of signal	12.75
Background	5.25
Statistical error	4.24
Significance	3.01

Figure 1: 150MeV Data Fit. Signal MC set to calculations in 2nd range. (./figs/data-fit-150mev.pdf)(sigcalc-150mev.tex)



Signal range	2.75-3.45
Number of signal	33.88
Background	17.12
Statistical error	7.14
Significance	4.74
Signal range	2.85-3.35
Number of signal	26.10
Background	11.90
Statistical error	6.16
Significance	4.23
Signal range	2.95-3.25
Number of signal	20.99
Background	7.01
Statistical error	5.29
Significance	3.97

Figure 2: 100MeV Data Fit. Signal MC set to calculations in 2nd range. (./figs/data-fit-100mev.pdf)(sigcalc-150mev.tex)

2 MC χ^2 Fit

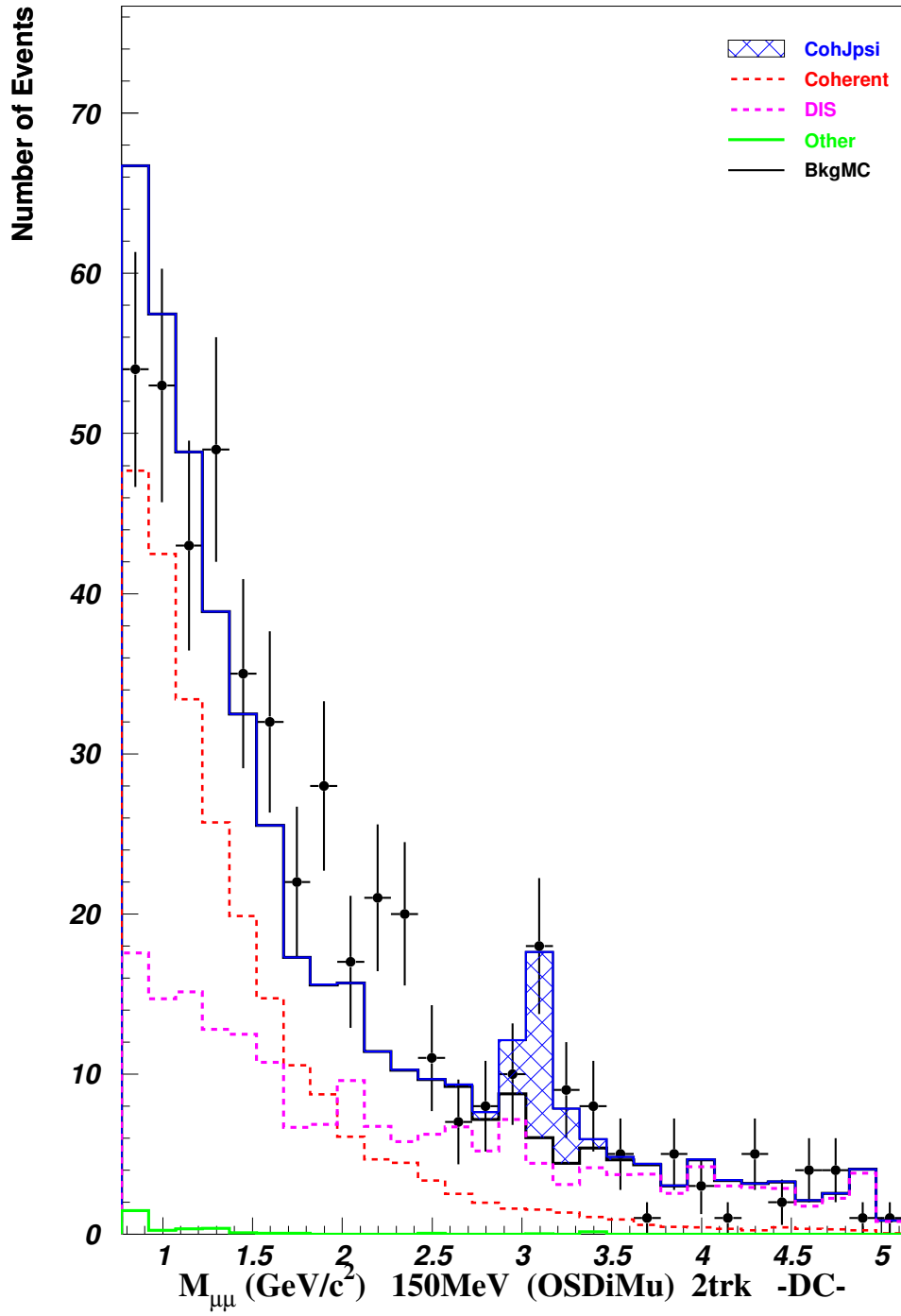


Figure 3: (./figs/mass-0.9to5-150mev.pdf)

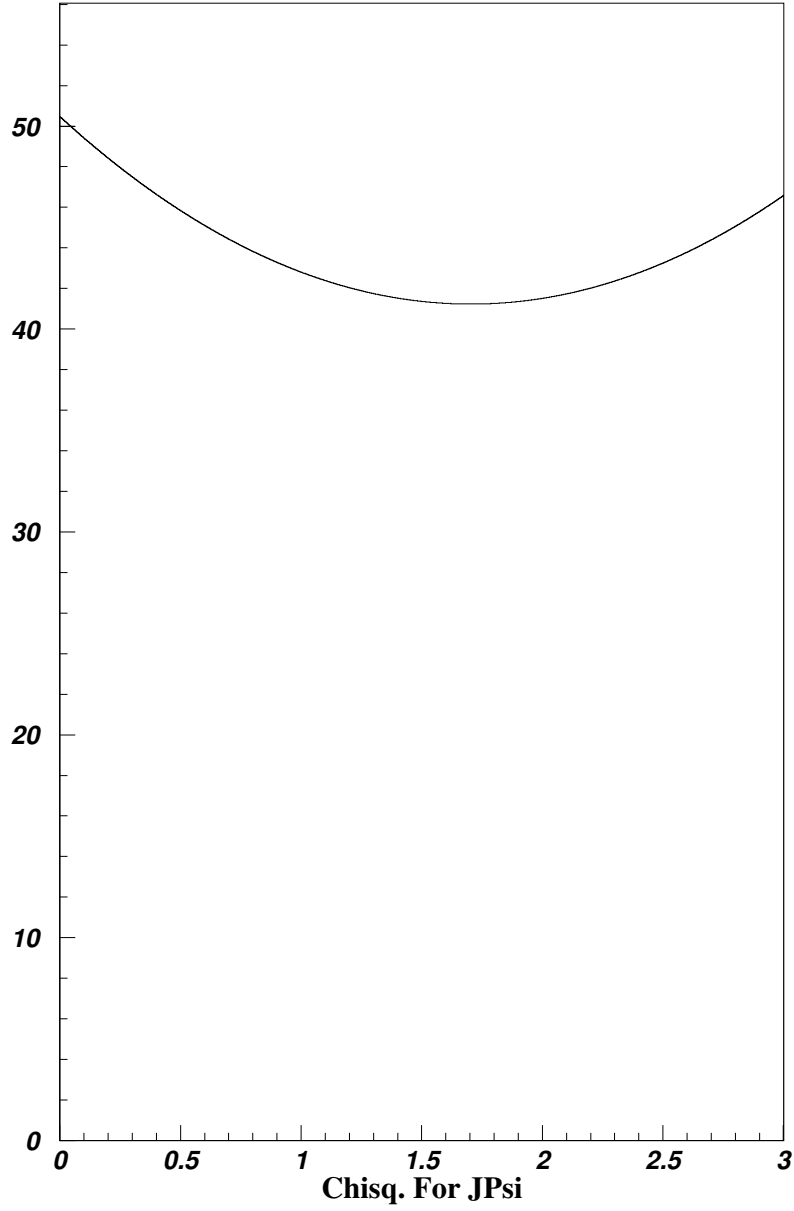


Figure 4: (chisq-jpsi.pdf)

χ^2 Min 41.231		
Number of bins used: 29.		
One σ : 1.192		
Norm at Min χ^2	JPsi	
-1σ	1.703	
	1.091	(35.9%)
$+1 \sigma$	2.315	(35.9%)

Table 2: χ^2 for JPsi on plot: 'Mmumu'

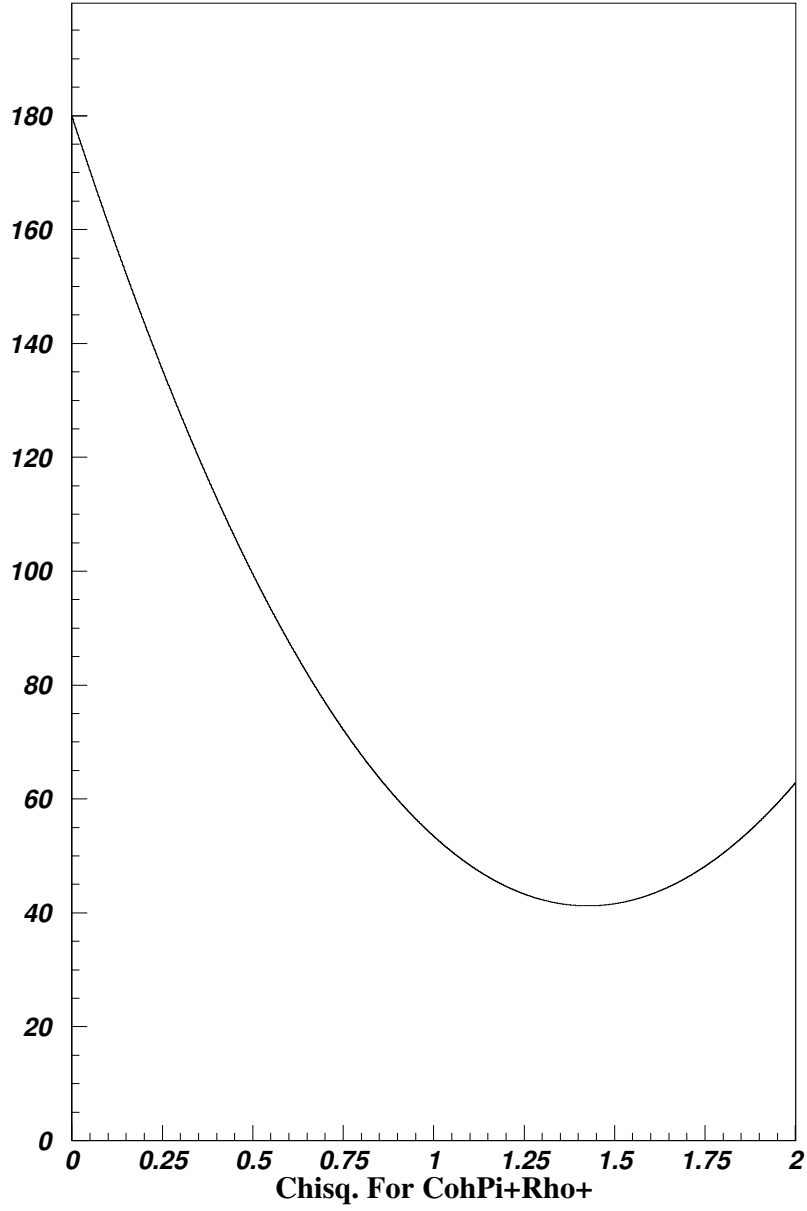


Figure 5: (chisq-cohpi.pdf)

χ^2 Min 41.231 Number of bins used: 29. One σ : 1.192		
Norm at Min χ^2	CohPi+Rho+	
-1σ	1.425	
	1.293	(9.3%)
$+1 \sigma$	1.559	(9.4%)

Table 3: χ^2 for CohPi+Rho+ on plot: 'Mmumu'

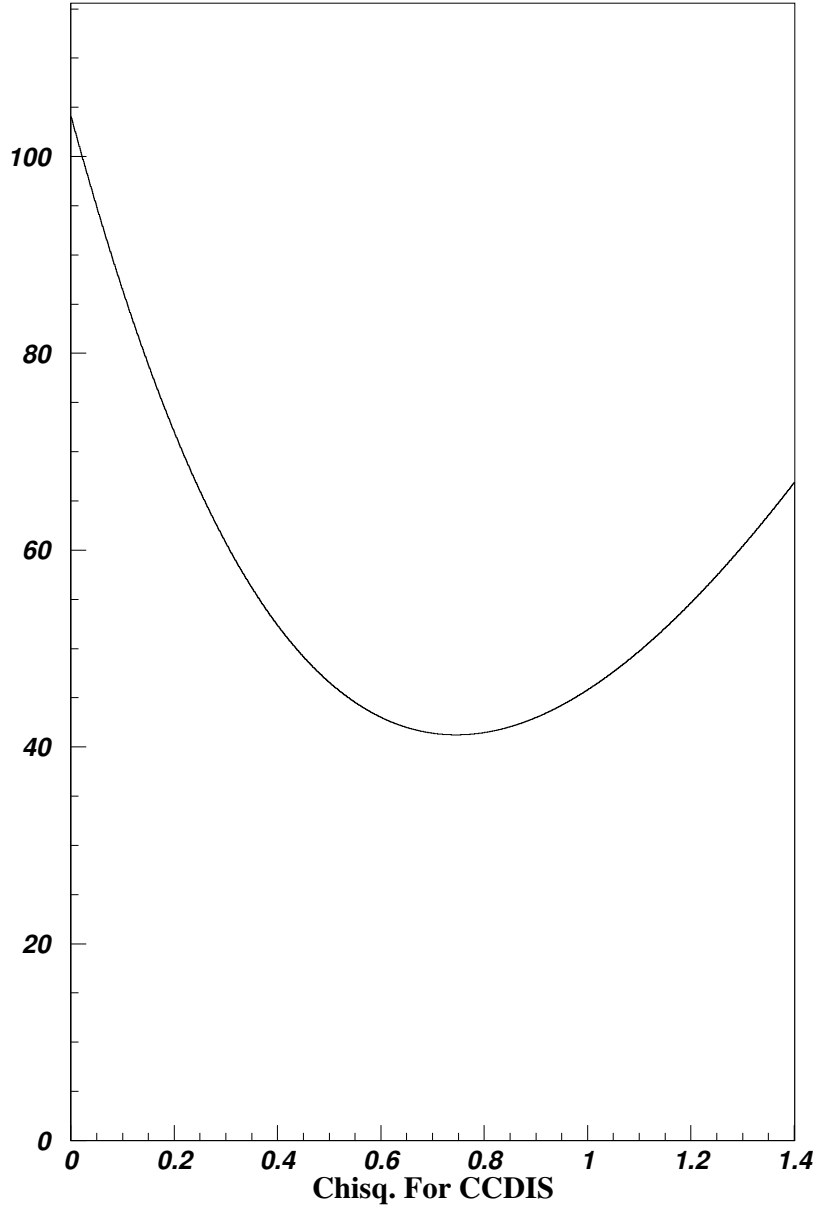


Figure 6: (chisq-ccdiss.pdf)

χ^2 Min 41.231		
Number of bins used: 29.		
One σ : 1.192		
Norm at Min χ^2	CCDIS	
-1σ	0.745	
	0.626	(16.0%)
$+1 \sigma$	0.871	(16.9%)

Table 4: χ^2 for CCDIS on plot: 'Mmumu'

3 Summary Cut Tables

Cut Name	Signal	CCDIS	Coh π^-	Coh π^+	Coh ρ^+	Coh J/ψ	Other	Total	Data	Data-Total
1) Raw Events	86.2	1942.2	203.7	12106.1	5034.4	47.5	3968.7	23388.8	10253.0	-13135.8
2) OBGfid,Trig+CohGenTh	86.2	1942.2	203.7	12106.1	5034.4	47.5	3968.7	23388.8	10253.0	-13135.8
3) Pfermi & W2	86.2	1942.2	203.7	12106.1	5034.4	47.5	3968.7	23388.8	10253.0	-13135.8
4) Focus Positive	86.2	1942.2	203.7	12106.1	5034.4	47.5	3968.7	23388.8	9217.0	-14171.8
5) Fid. Vol. -X	82.6	1828.8	192.5	11624.2	4811.1	45.5	3758.5	22343.1	8110.0	-14233.1
6) Fid. Vol. -Y	79.5	1697.0	183.7	11225.4	4616.0	43.8	3550.5	21395.9	6832.0	-14563.9
7) Fid. Vol. -Z (OFF)	79.5	1697.0	183.7	11225.4	4616.0	43.8	3550.5	21395.9	6832.0	-14563.9
8) At Least 1 Mu	75.2	1697.0	170.2	11076.4	4263.7	43.8	277.3	17603.6	6832.0	-10771.6
9) ncand=2,3,4	75.2	1697.0	170.2	11076.4	4263.7	43.8	277.3	17603.6	6832.0	-10771.6
10) tnchgd=2	74.5	1525.2	166.8	10839.7	4164.4	43.4	236.1	17050.1	4373.0	-12677.1
11) +/- Tracks (V0)	74.5	1471.0	166.7	10832.6	4157.6	43.4	214.3	16960.1	3789.0	-13171.1
12) Tube/Veto Cut	74.5	1471.0	166.7	10832.6	4157.6	43.4	214.3	16960.1	3789.0	-13171.1
13) 2 Muons (1mux)	45.9	1471.0	13.2	988.4	773.9	40.0	180.1	3512.5	3789.0	276.5
14) PmuAsymj0.0	23.2	288.6	10.6	199.4	213.5	20.1	97.7	853.0	884.0	31.0
15) Theta<2.62 rad	23.2	288.1	10.6	199.2	213.3	20.1	97.7	852.2	855.0	2.8
16) Pt+wrt- >0.05	23.2	288.1	10.6	199.1	213.0	20.1	97.7	851.8	854.0	2.2
17) Mee > 2.0 (OFF)	23.2	288.1	10.6	199.1	213.0	20.1	97.7	851.8	854.0	2.2
18) Upstream Hanger cut	23.2	272.8	10.5	198.1	212.0	20.1	93.2	829.9	837.0	7.1
19) nsecond<4	23.2	265.9	10.5	196.1	208.2	20.1	91.3	815.3	815.0	-0.3
20) Fid. Vol. Hanger cut	23.2	236.8	10.1	188.0	193.5	19.9	82.4	753.9	749.0	-4.9
21) No Hangers fromPVert	23.2	218.1	10.1	186.4	191.7	19.9	74.0	723.4	723.0	-0.4
22) Pz>0 for tracks	23.2	218.1	10.1	186.4	191.7	19.9	74.0	723.4	723.0	-0.4
23) Thprimord<0.4	23.2	200.6	9.9	183.5	145.8	19.9	67.5	650.4	642.0	-8.4
24) Nunh*fracunh<200	23.2	200.6	9.9	183.4	145.6	19.9	67.5	650.1	637.0	-13.1
25) Emumu>2GeV	23.2	200.6	9.9	183.4	145.6	19.9	67.5	650.1	637.0	-13.1
26) P+,P->0.5	23.2	200.6	9.9	183.4	145.6	19.9	67.5	650.1	637.0	-13.1
27) P+,P->1.0 (2.5mux)	23.2	200.6	9.9	183.4	145.6	19.9	67.5	650.1	637.0	-13.1
28) Emumu>5GeV (8mux)	23.1	200.0	9.9	183.4	145.5	19.9	67.5	649.3	636.0	-13.3
29) Phi12>90deg (OFF)	23.1	200.0	9.9	183.4	145.5	19.9	67.5	649.3	636.0	-13.3
30) Pmumu>10GeV (OFF)	23.1	200.0	9.9	183.4	145.5	19.9	67.5	649.3	636.0	-13.3

Table 5: Summary Cut Table (all events)

Cut Name	Signal	CCDIS	Coh π^-	Coh π^+	Coh ρ^+	Coh J/ψ	Other	Total	Data	Data-Total
1) Raw Events	86.2	1761.8	191.2	11202.1	4736.0	1.4	3961.4	21940.0	9792.0	-12148.0
2) OBGfid,Trig+CohGenTh	86.2	1761.8	191.2	11202.1	4736.0	1.4	3961.4	21940.0	9792.0	-12148.0
3) Pfermi & W2	86.2	1761.8	191.2	11202.1	4736.0	1.4	3961.4	21940.0	9792.0	-12148.0
4) Focus Positive	86.2	1761.8	191.2	11202.1	4736.0	1.4	3961.4	21940.0	8798.0	-13142.0
5) Fid. Vol. -X	82.6	1656.7	180.7	10744.5	4525.9	1.2	3751.8	20943.5	7714.0	-13229.5
6) Fid. Vol. -Y	79.5	1536.4	172.4	10368.4	4341.8	1.2	3544.2	20044.0	6454.0	-13590.0
7) Fid. Vol. -Z (OFF)	79.5	1536.4	172.4	10368.4	4341.8	1.2	3544.2	20044.0	6454.0	-13590.0
8) At Least 1 Mu	75.2	1536.4	158.9	10219.2	3989.6	1.2	271.2	16251.7	6454.0	-9797.7
9) ncand=2,3,4	75.2	1536.4	158.9	10219.2	3989.6	1.2	271.2	16251.7	6454.0	-9797.7
10) tnchgd=2	74.5	1375.9	155.7	9996.5	3894.4	1.2	230.5	15728.7	4049.0	-11679.7
11) +/- Tracks (V0)	74.5	1325.1	155.6	9989.7	3887.8	1.0	209.8	15643.6	3472.0	-12171.6
12) Tube/Veto Cut	74.5	1325.1	155.6	9989.7	3887.8	1.0	209.8	15643.6	3472.0	-12171.6
13) 2 Muons (1mux)	45.9	1325.1	12.9	956.3	737.3	1.0	176.0	3254.6	3472.0	217.4
14) PmuAsymj0.0	23.2	255.0	10.3	196.5	205.6	0.5	95.0	786.2	821.0	34.8
15) Theta<2.62 rad	23.2	254.5	10.3	196.4	205.5	0.5	94.9	785.3	792.0	6.7
16) Pt+wrt- >0.05	23.2	254.5	10.3	196.1	205.2	0.5	94.9	784.7	791.0	6.3
17) Mee > 2.0 (OFF)	23.2	254.5	10.3	196.1	205.2	0.5	94.9	784.7	791.0	6.3
18) Upstream Hanger cut	23.2	240.7	10.2	195.2	204.3	0.5	90.6	764.8	774.0	9.2
19) nsecond<4	23.2	234.3	10.2	193.4	200.6	0.5	88.9	751.1	752.0	0.9
20) Fid. Vol. Hanger cut	23.2	208.0	9.8	185.4	186.2	0.5	80.3	693.5	689.0	-4.5
21) No Hangers fromPVert	23.2	192.1	9.8	183.8	184.5	0.5	72.4	666.3	664.0	-2.3
22) Pz>0 for tracks	23.2	192.1	9.8	183.8	184.5	0.5	72.4	666.3	664.0	-2.3
23) Thprimord<0.4	23.2	176.3	9.6	181.0	140.5	0.5	66.4	597.5	593.0	-4.5
24) Nunh*fracunh<200	23.2	176.3	9.6	181.0	140.5	0.5	66.4	597.5	588.0	-9.5
25) Emumu>2GeV	23.2	176.3	9.6	181.0	140.5	0.5	66.4	597.5	588.0	-9.5
26) P+,P->0.5	23.2	176.3	9.6	181.0	140.5	0.5	66.4	597.5	588.0	-9.5
27) P+,P->1.0 (2.5mux)	23.2	176.3	9.6	181.0	140.5	0.5	66.4	597.5	588.0	-9.5
28) Emumu>5GeV (8mux)	23.1	175.8	9.6	180.8	140.4	0.5	66.4	596.6	587.0	-9.6
29) Phi12>90deg (OFF)	23.1	175.8	9.6	180.8	140.4	0.5	66.4	596.6	587.0	-9.6
30) Pmumu>10GeV (OFF)	23.1	175.8	9.6	180.8	140.4	0.5	66.4	596.6	587.0	-9.6

Table 6: Summary Cut Table (**mass blind**)

Cut Name	Signal	CCDIS	Coh π^-	Coh π^+	Coh ρ^+	Coh J/ψ	Other	Total	Data	Data-Total
1) Raw Events	0.0	180.4	12.4	904.0	298.4	46.2	7.6	1449.0	461.0	-988.0
2) OBGfid,Trig+CohGenTh	0.0	180.4	12.4	904.0	298.4	46.2	7.6	1449.0	461.0	-988.0
3) Pfermi & W2	0.0	180.4	12.4	904.0	298.4	46.2	7.6	1449.0	461.0	-988.0
4) Focus Positive	0.0	180.4	12.4	904.0	298.4	46.2	7.6	1449.0	419.0	-1030.0
5) Fid. Vol. -X	0.0	172.0	11.8	879.7	285.1	44.3	6.6	1399.5	396.0	-1003.5
6) Fid. Vol. -Y	0.0	160.5	11.3	857.0	274.2	42.6	6.2	1351.8	378.0	-973.8
7) Fid. Vol. -Z (OFF)	0.0	160.5	11.3	857.0	274.2	42.6	6.2	1351.8	378.0	-973.8
8) At Least 1 Mu	0.0	160.5	11.3	857.0	274.2	42.6	6.2	1351.8	378.0	-973.8
9) ncand=2,3,4	0.0	160.5	11.3	857.0	274.2	42.6	6.2	1351.8	378.0	-973.8
10) tnchgd=2	0.0	149.2	11.1	843.2	270.0	42.4	5.5	1321.4	324.0	-997.4
11) +/- Tracks (V0)	0.0	145.9	11.1	842.9	269.6	42.4	4.6	1316.5	317.0	-999.5
12) Tube/Veto Cut	0.0	145.9	11.1	842.9	269.6	42.4	4.6	1316.5	317.0	-999.5
13) 2 Muons (1mux)	0.0	145.9	0.3	32.1	36.5	39.0	4.1	257.8	317.0	59.2
14) PmuAsymj0.0	0.0	33.6	0.3	3.0	7.8	19.6	2.7	67.0	63.0	-4.0
15) Theta<2.62 rad	0.0	33.6	0.3	3.0	7.8	19.6	2.7	67.0	63.0	-4.0
16) Pt+wrt- >0.05	0.0	33.6	0.3	3.0	7.8	19.6	2.7	67.0	63.0	-4.0
17) Mee > 2.0 (OFF)	0.0	33.6	0.3	3.0	7.8	19.6	2.7	67.0	63.0	-4.0
18) Upstream Hanger cut	0.0	32.1	0.3	2.8	7.7	19.6	2.5	65.0	63.0	-2.0
19) nsecond<4	0.0	31.6	0.3	2.8	7.6	19.6	2.3	64.2	63.0	-1.2
20) Fid. Vol. Hanger cut	0.0	28.8	0.3	2.6	7.3	19.4	2.0	60.4	60.0	-0.4
21) No Hangers fromPVert	0.0	26.0	0.3	2.6	7.1	19.4	1.6	57.0	59.0	2.0
22) Pz>0 for tracks	0.0	26.0	0.3	2.6	7.1	19.4	1.6	57.0	59.0	2.0
23) Thprimord<0.4	0.0	24.1	0.3	2.6	5.3	19.4	1.2	52.9	49.0	-3.9
24) Nunh*fracunh<200	0.0	24.1	0.3	2.6	5.3	19.4	1.2	52.9	49.0	-3.9
25) Emumu>2GeV	0.0	24.1	0.3	2.6	5.3	19.4	1.2	52.9	49.0	-3.9
26) P+,P->0.5	0.0	24.1	0.3	2.6	5.3	19.4	1.2	52.9	49.0	-3.9
27) P+,P->1.0 (2.5mux)	0.0	24.1	0.3	2.6	5.3	19.4	1.2	52.9	49.0	-3.9
28) Emumu>5GeV (8mux)	0.0	24.1	0.3	2.6	5.3	19.4	1.2	52.9	49.0	-3.9
29) Phi12>90deg (OFF)	0.0	24.1	0.3	2.6	5.3	19.4	1.2	52.9	49.0	-3.9
30) Pmumu>10GeV (OFF)	0.0	24.1	0.3	2.6	5.3	19.4	1.2	52.9	49.0	-3.9

Table 7: Summary Cut Table (**mass sig.**)

4 Plots

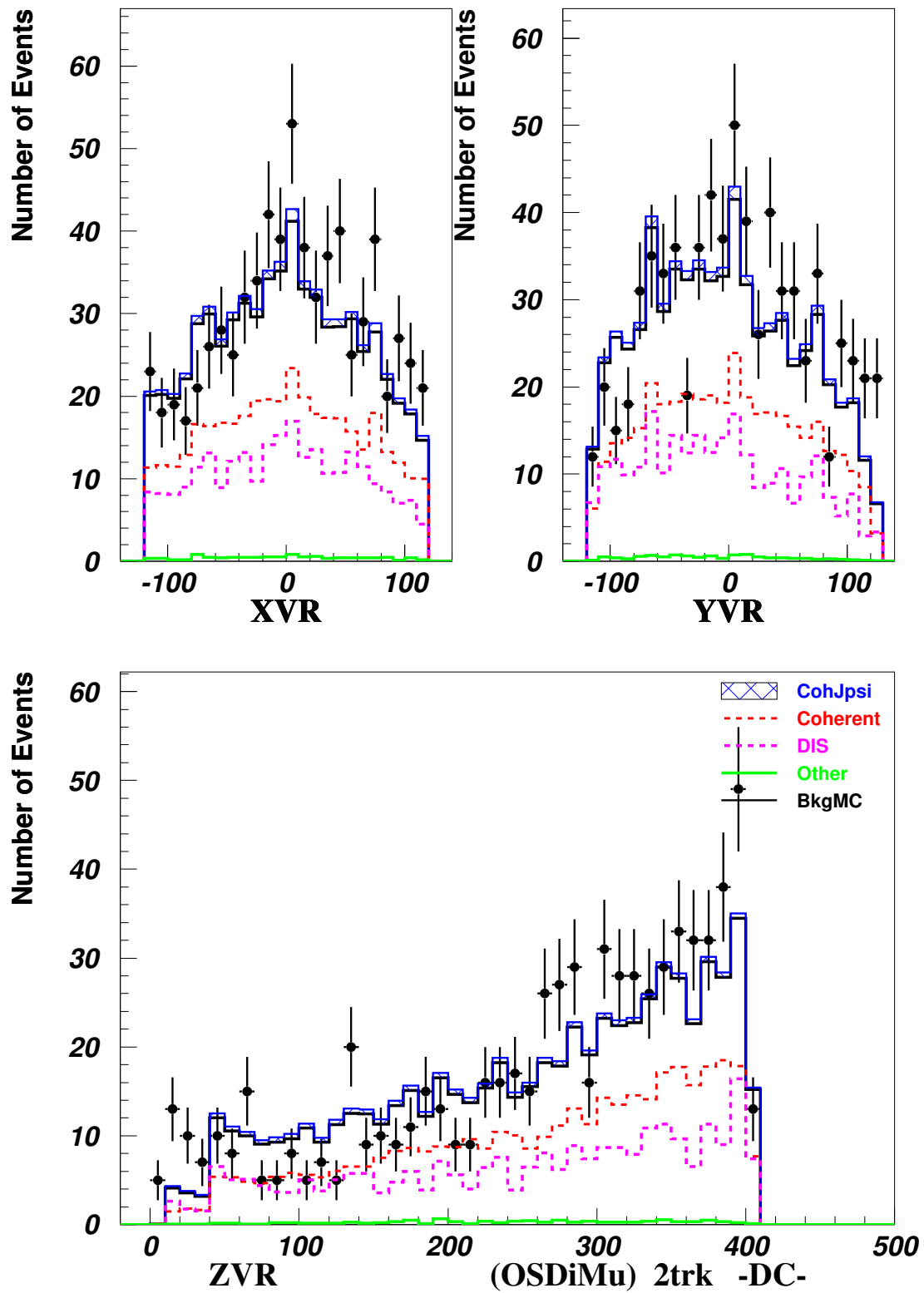


Figure 7: (./figs/vertex.pdf)

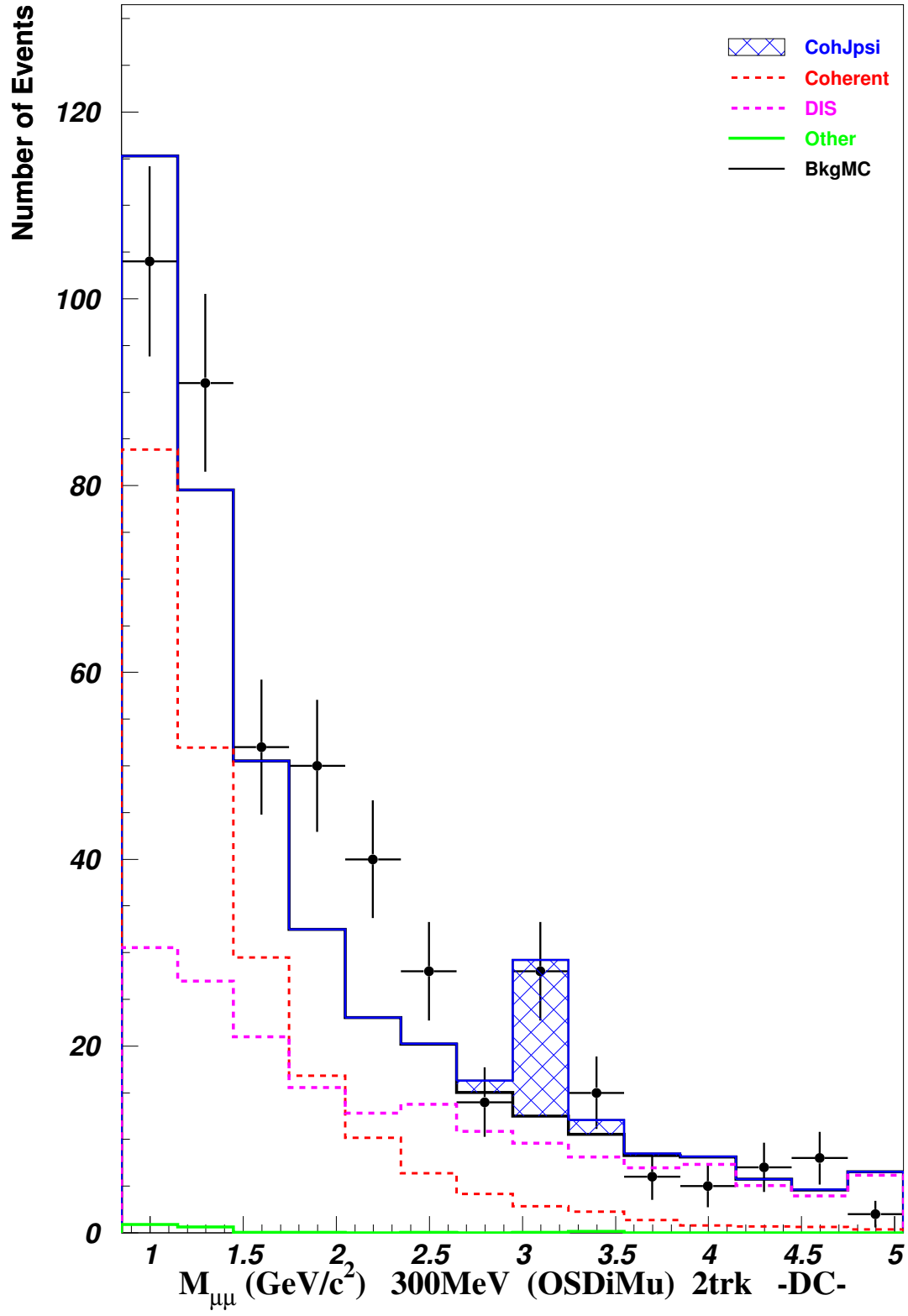


Figure 8: (./figs/mass-0.9to5-300mev.pdf)

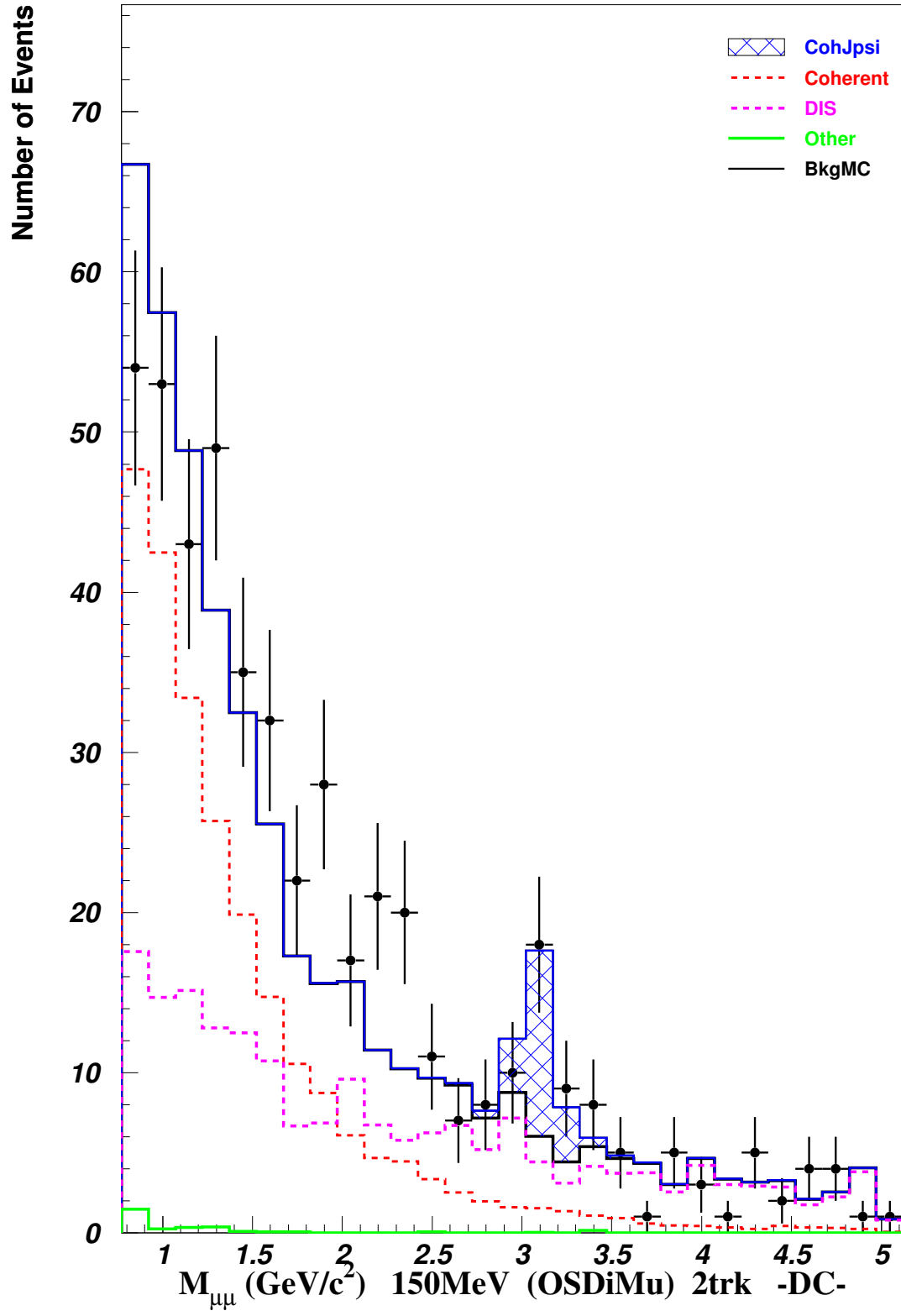


Figure 9: (./figs/mass-0.9to5-150mev.pdf)

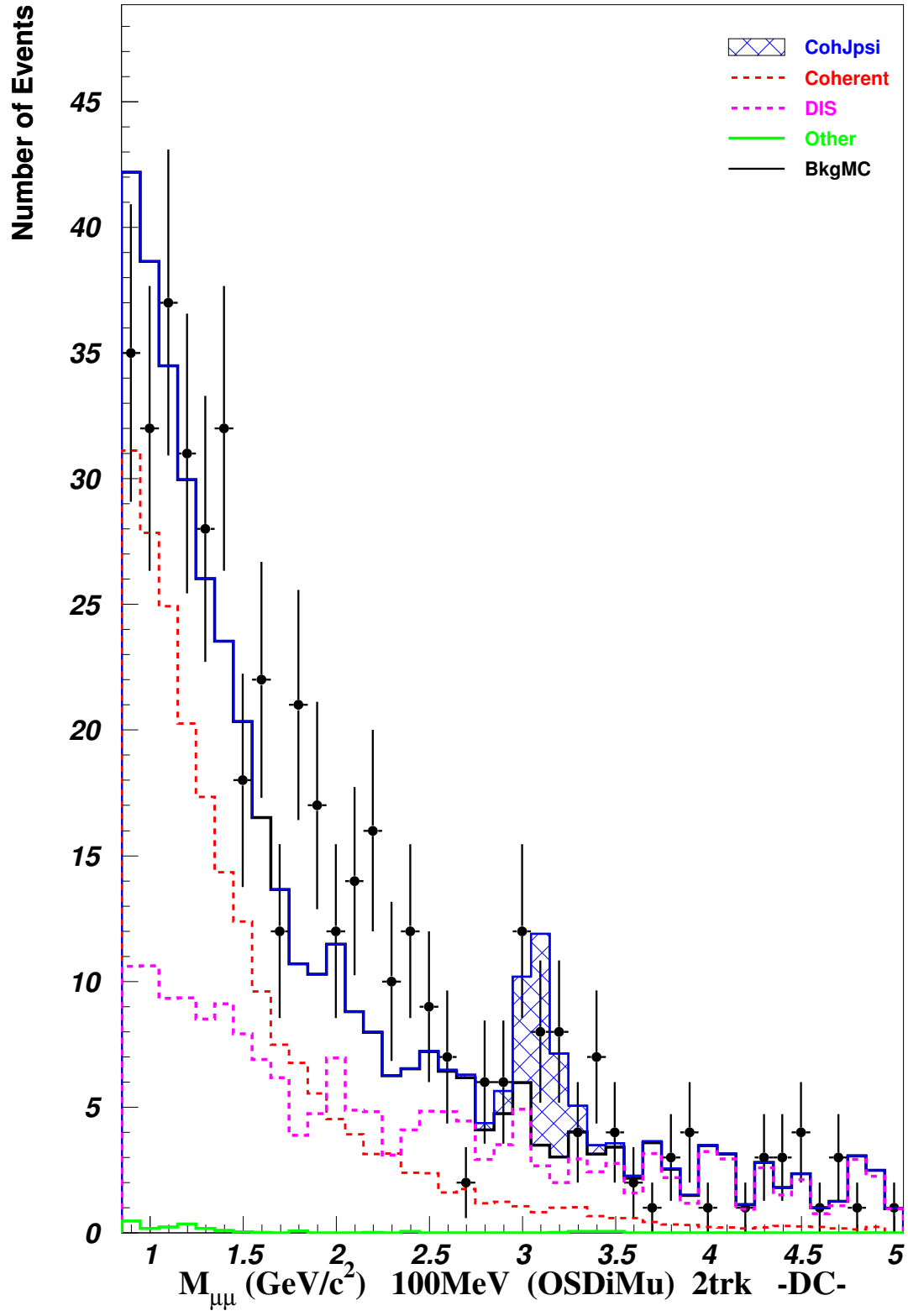


Figure 10: (./figs/mass-0.9to5-100mev.pdf)

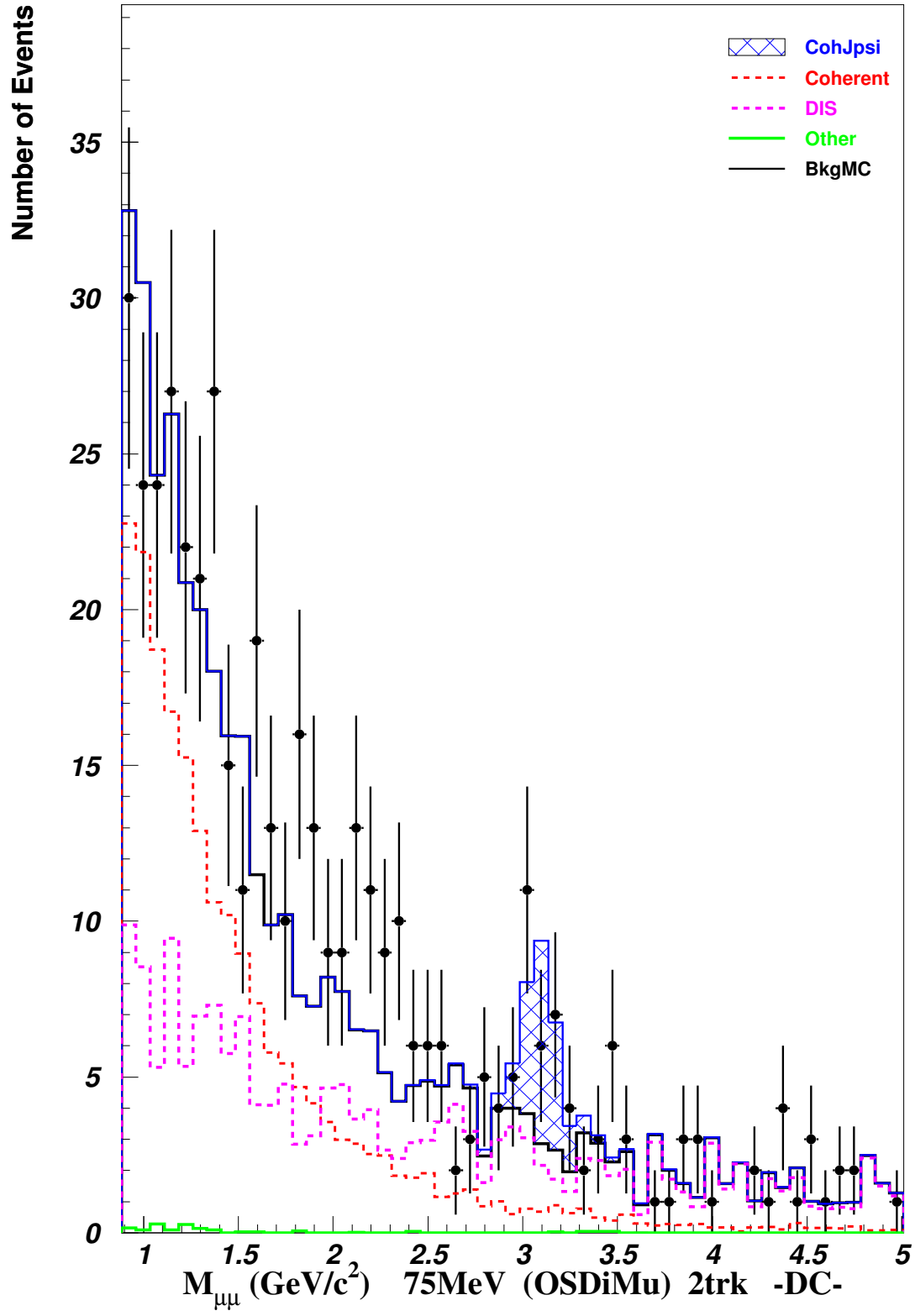


Figure 11: (./figs/mass-0.9to5-75mev.pdf)

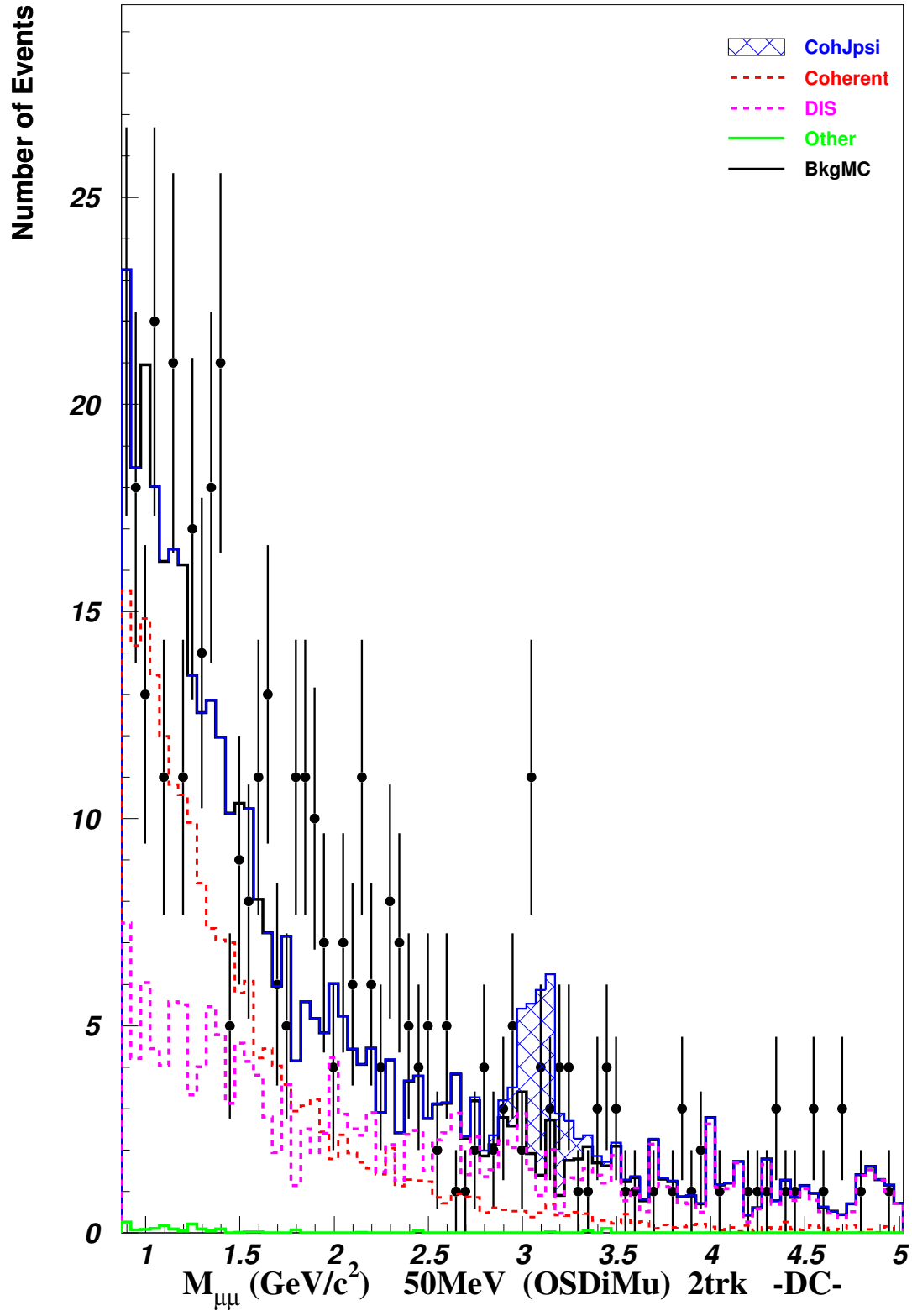


Figure 12: (./figs/mass-0.9to5-50mev.pdf)

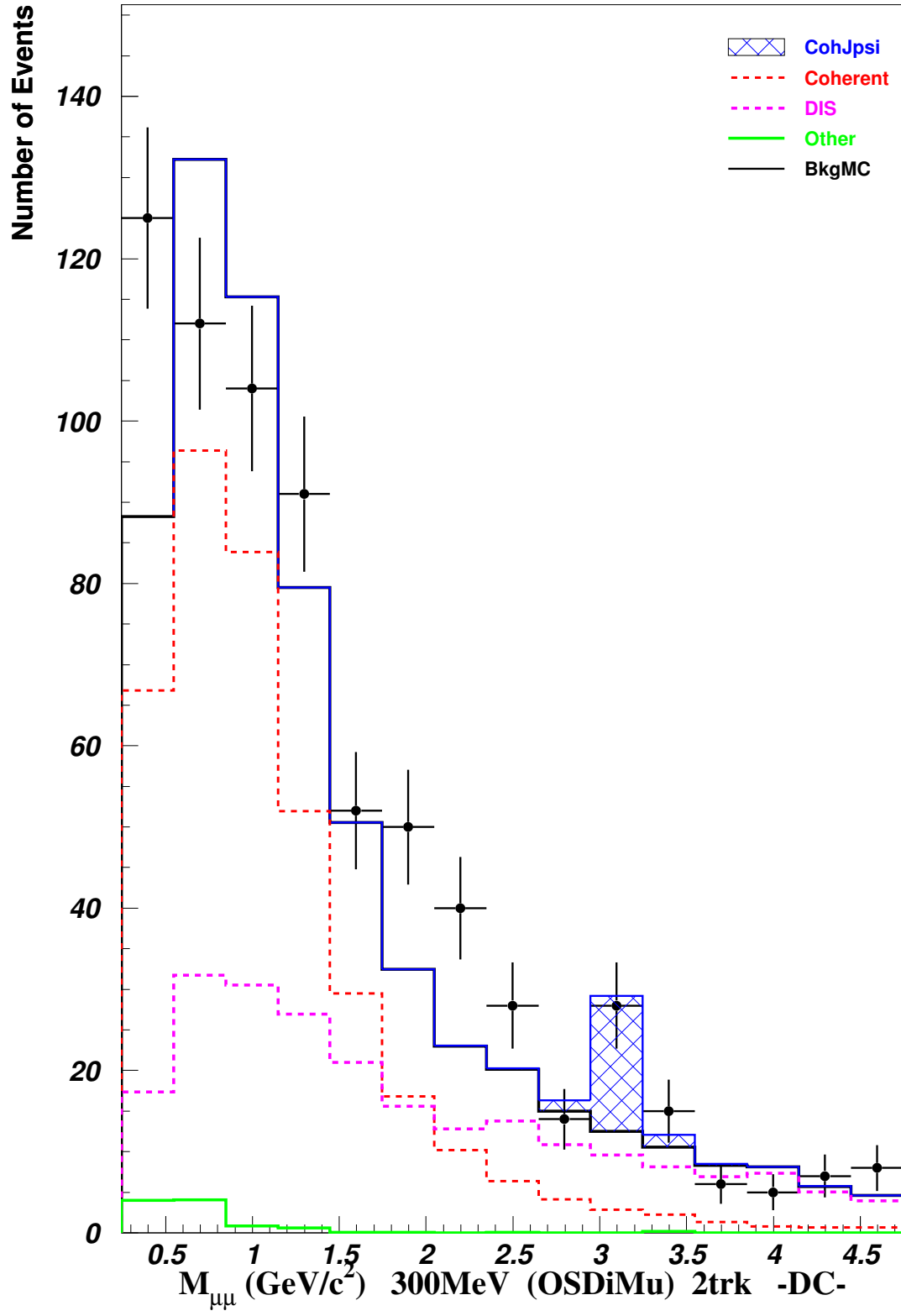


Figure 13: (./figs/mass-0to5-300mev.pdf)

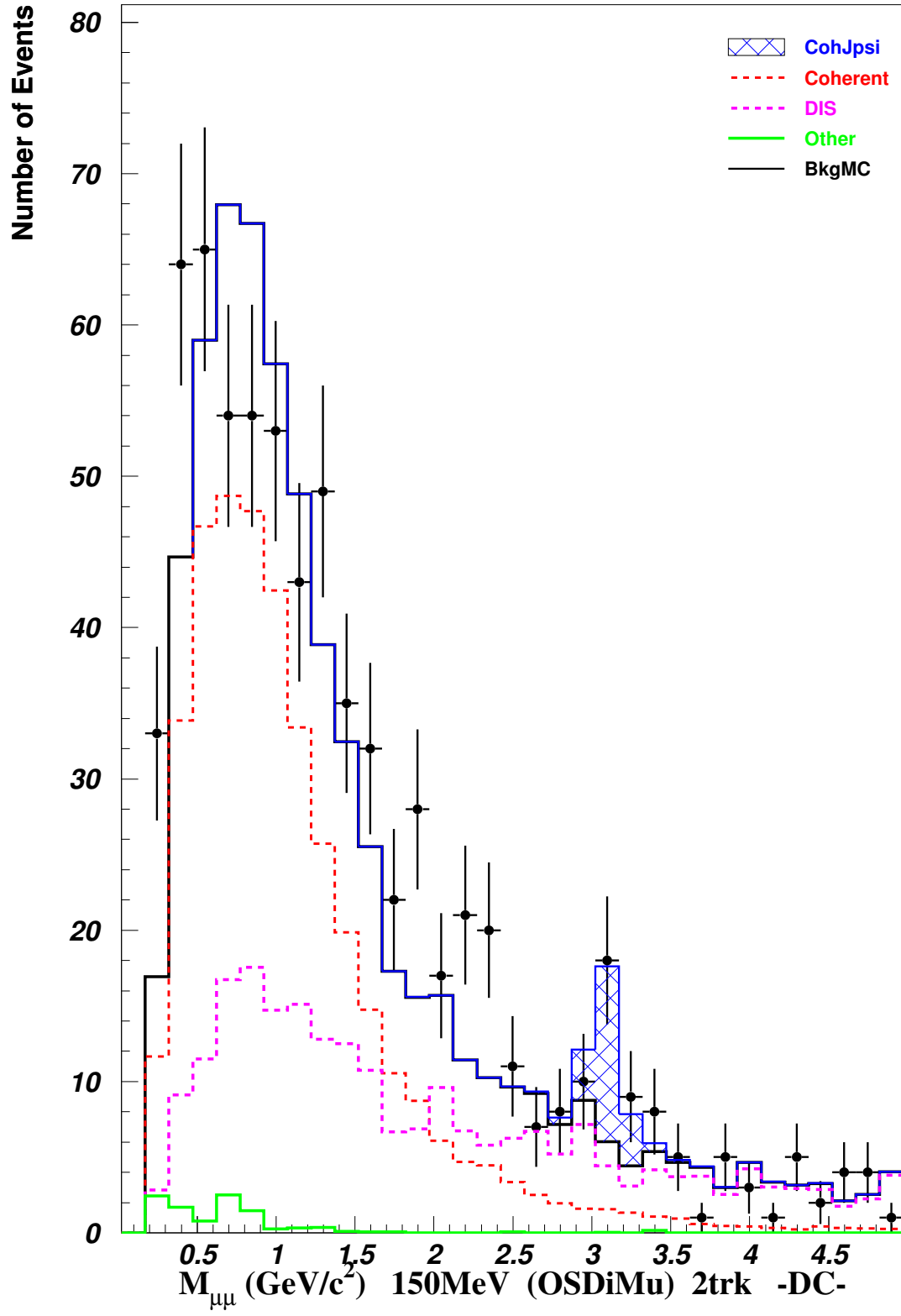


Figure 14: (./figs/mass-0to5-150mev.pdf)

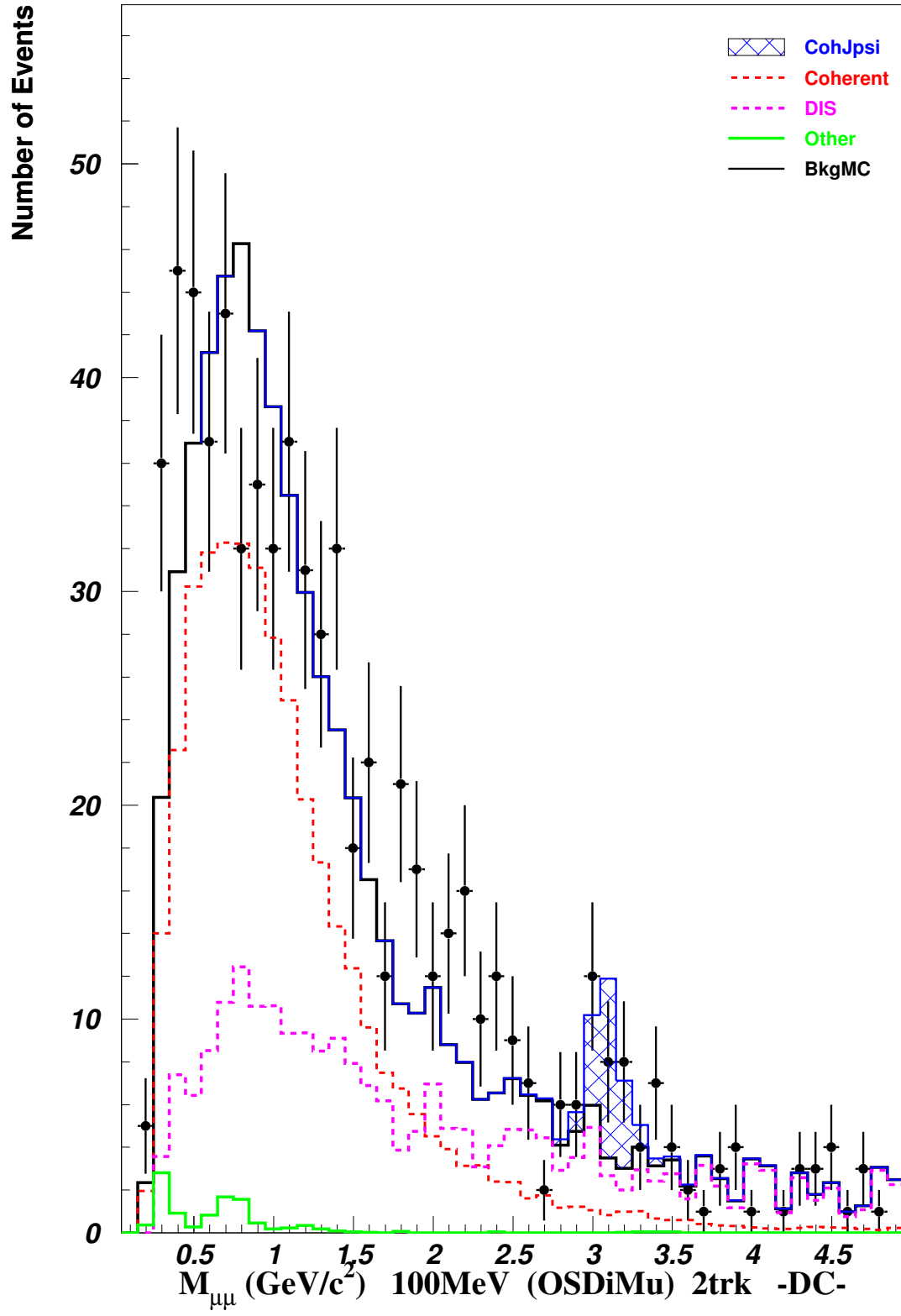


Figure 15: (./figs/mass-0to5-100mev.pdf)

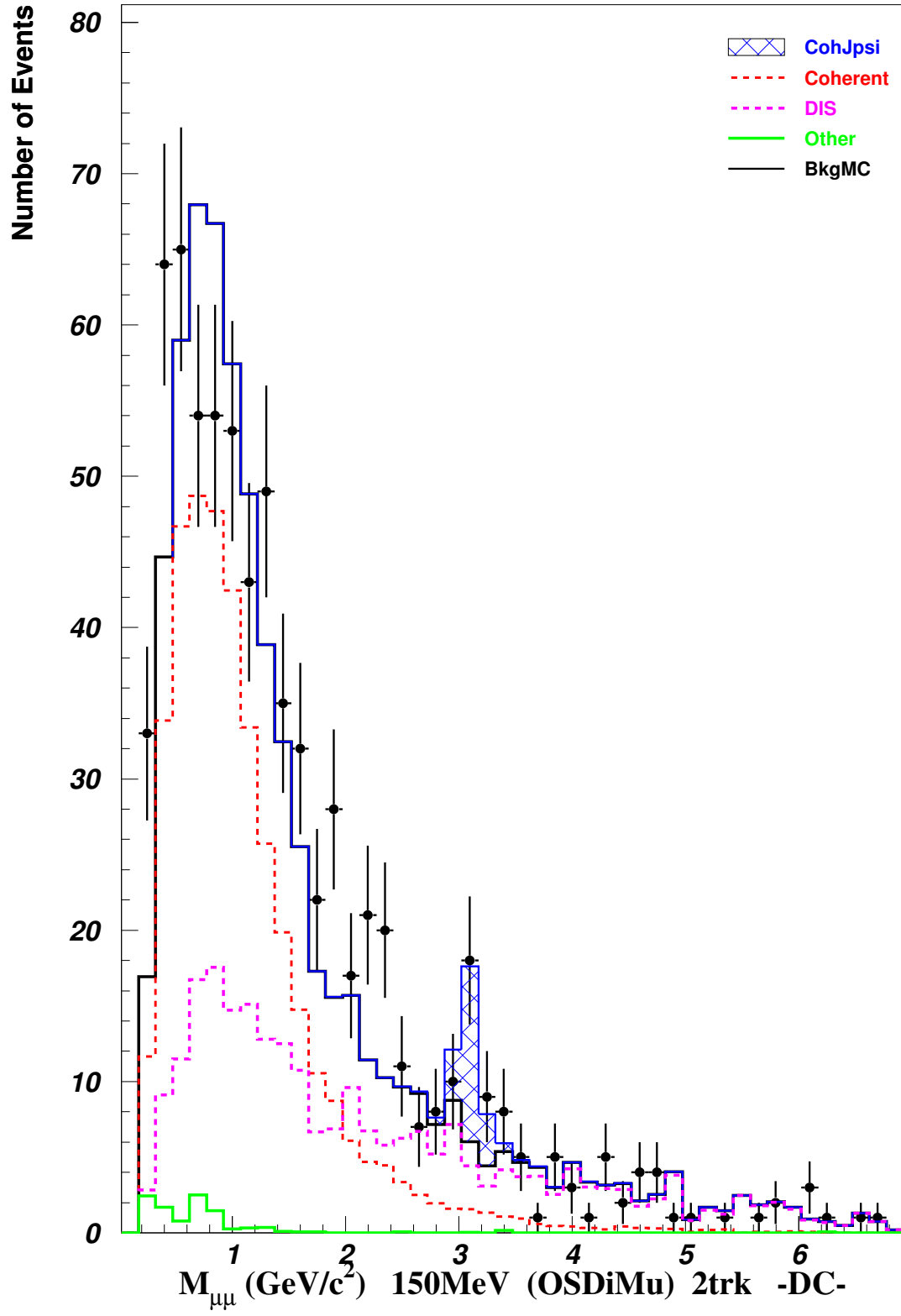


Figure 16: (./figs/mass-0to7-150mev.pdf)

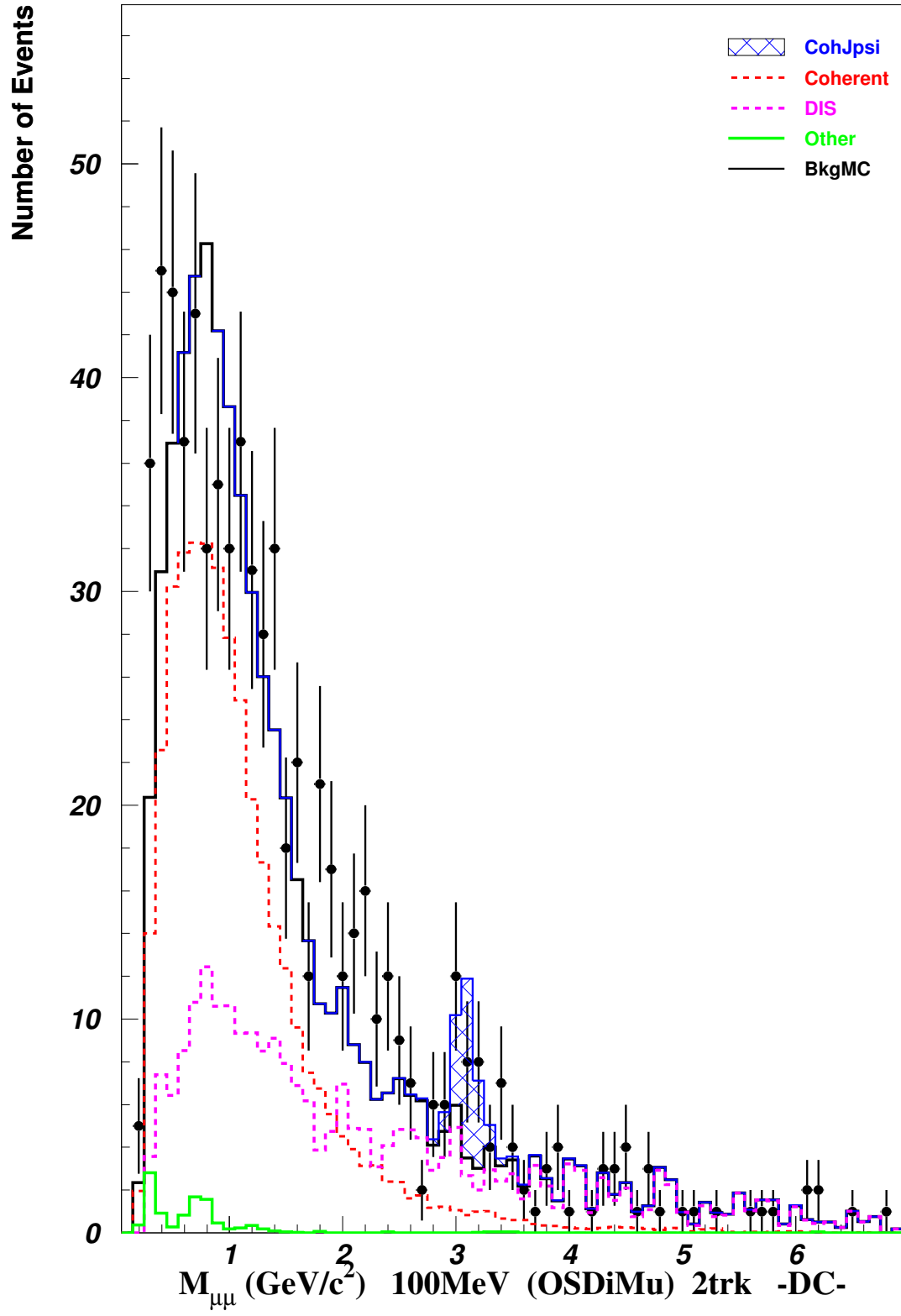


Figure 17: (./figs/mass-0to7-100mev.pdf)

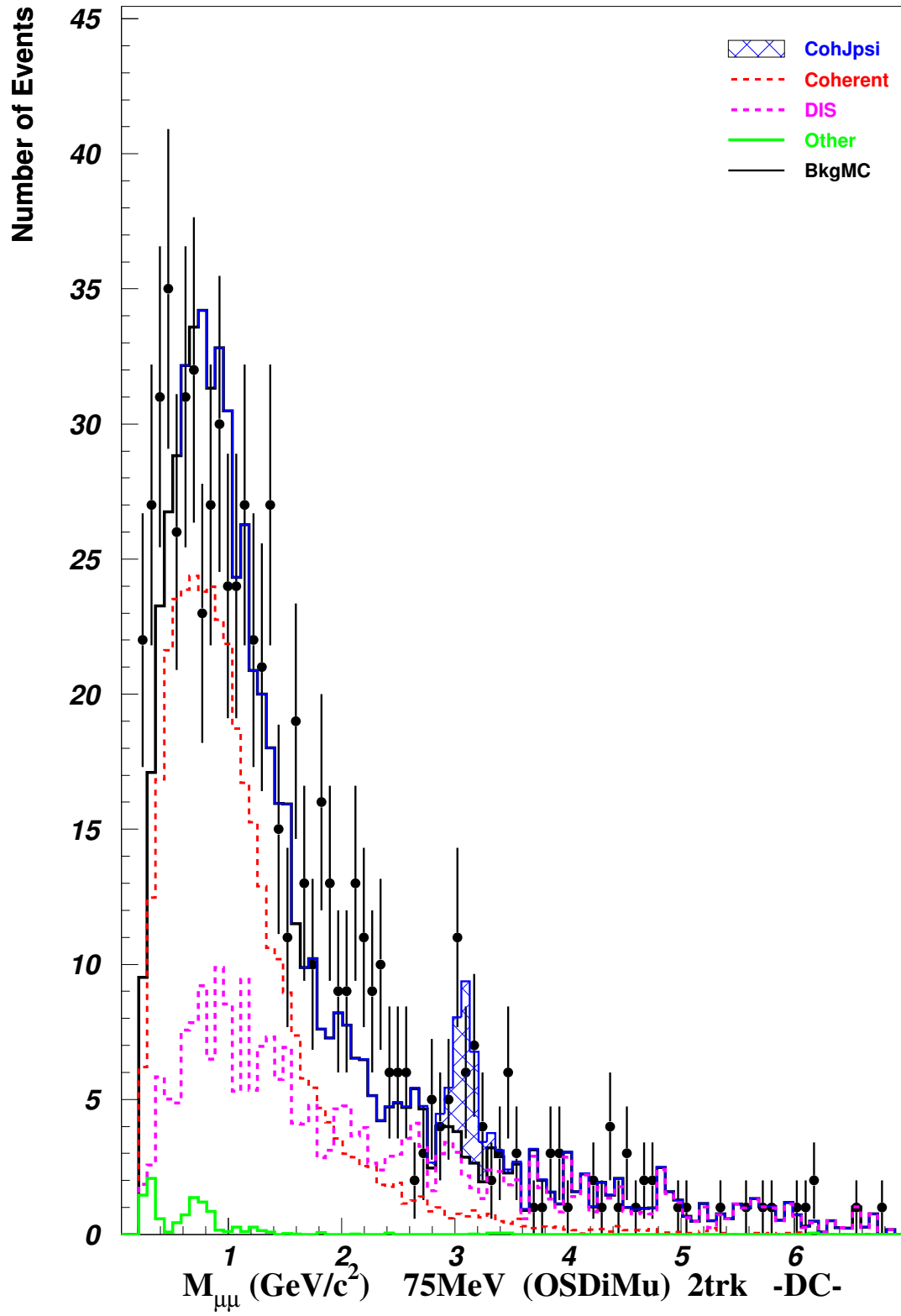


Figure 18: (./figs/mass-0to7-75mev.pdf)

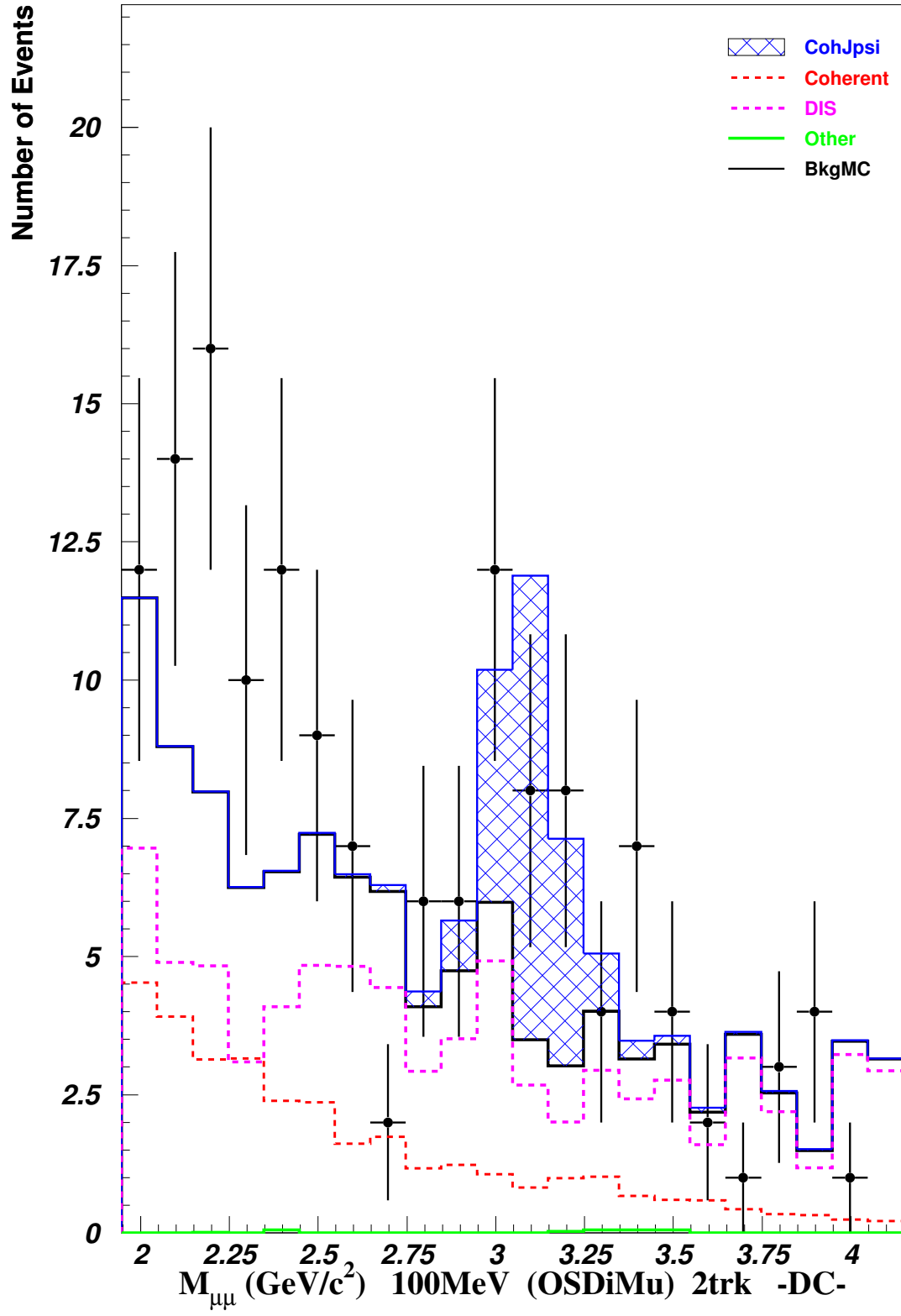


Figure 19: (./figs/mass-2to4-100mev.pdf)

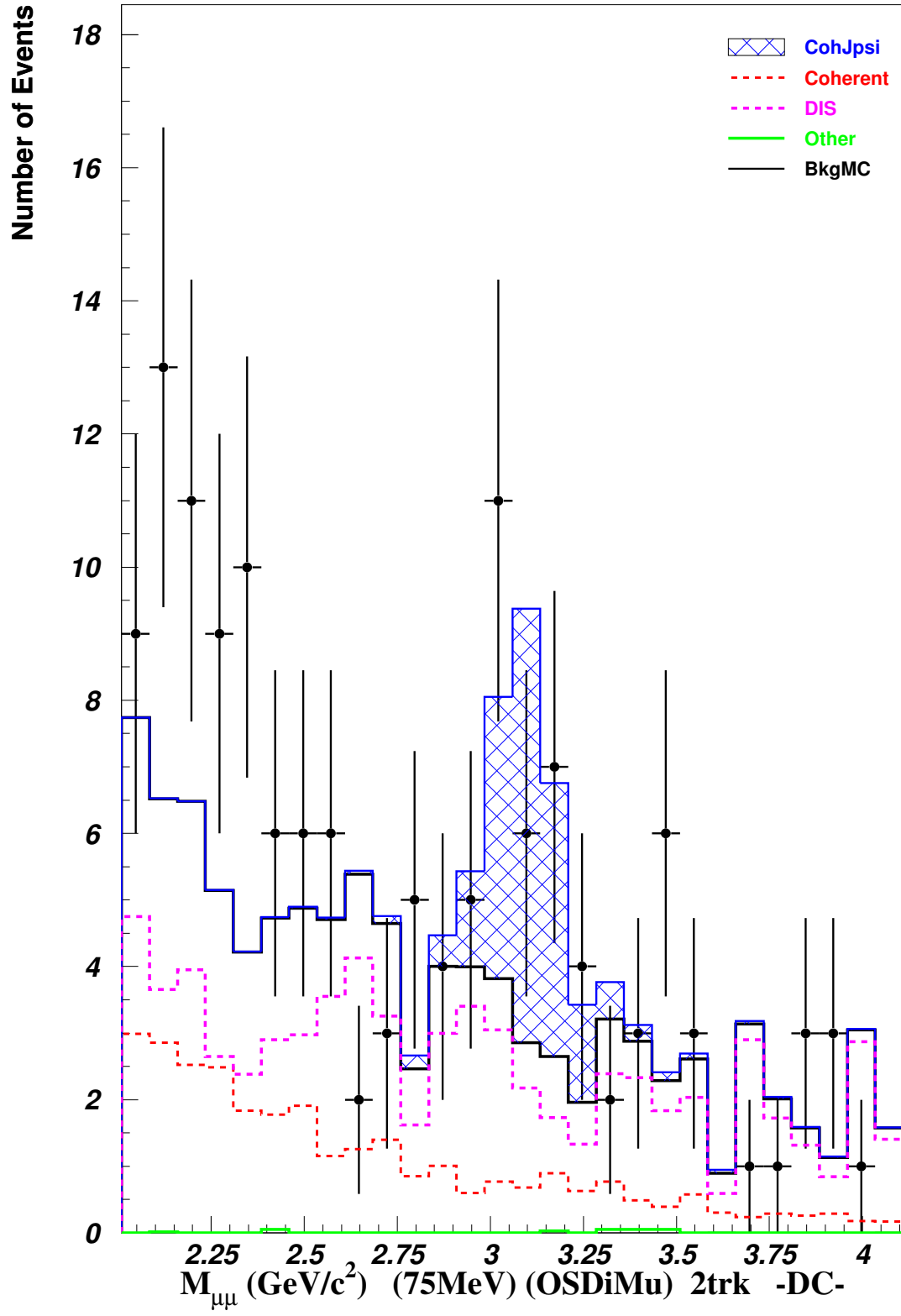


Figure 20: (./figs/mass-2to4-75mev.pdf)

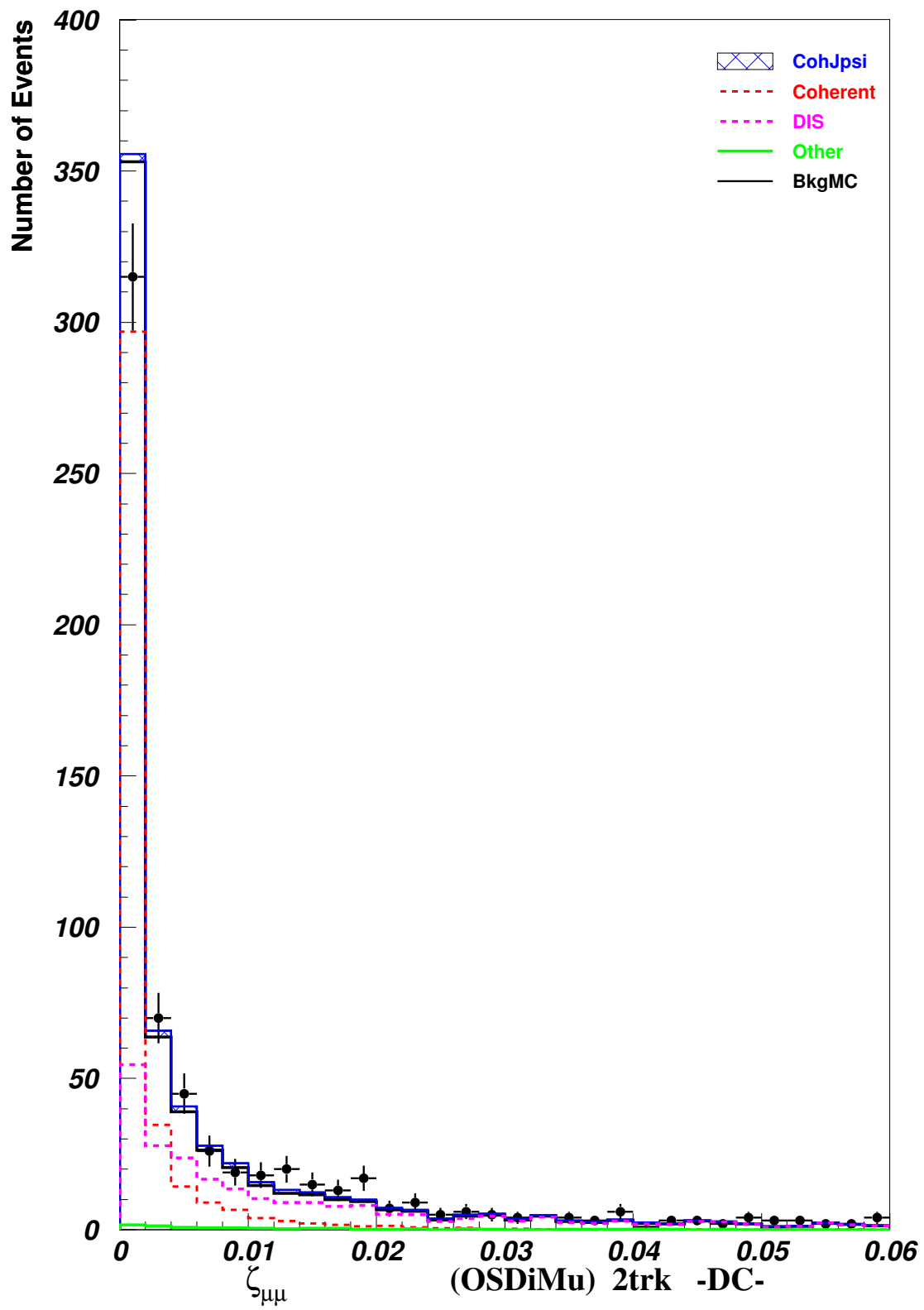


Figure 21: (./figs/zetamumu.pdf)

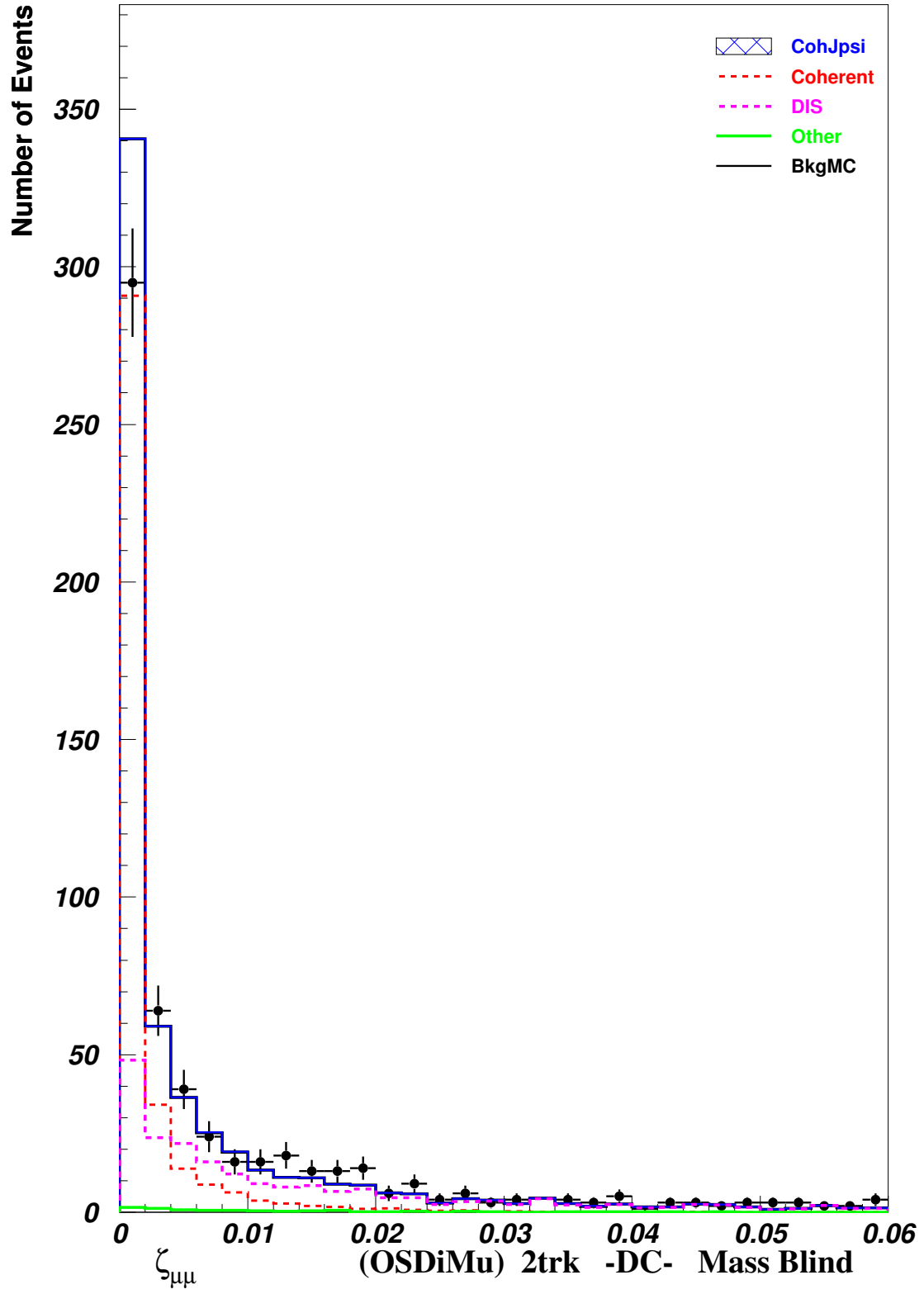


Figure 22: (./figs/zetamumu-mb.pdf)

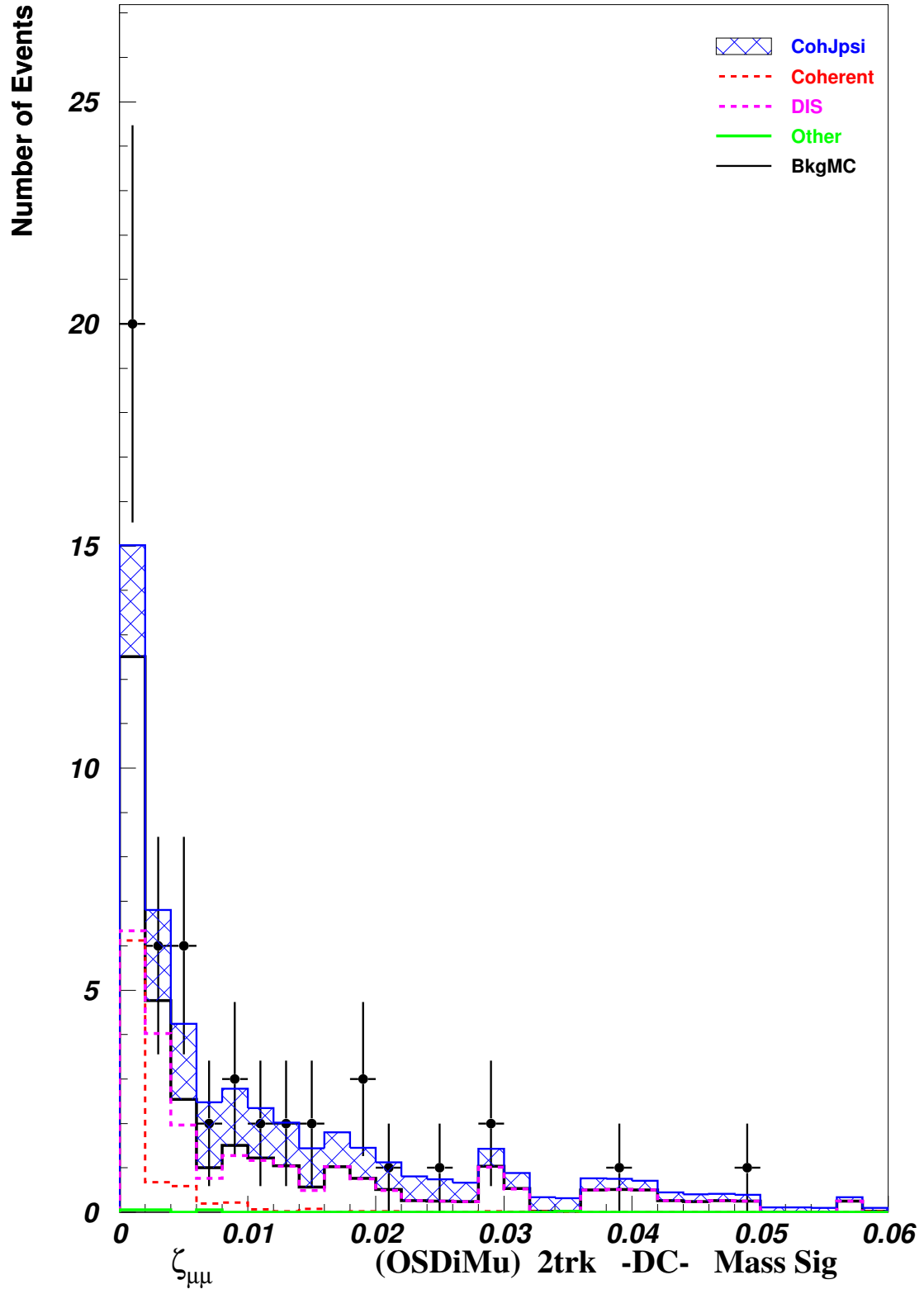


Figure 23: (./figs/zetamumu-msig.pdf)

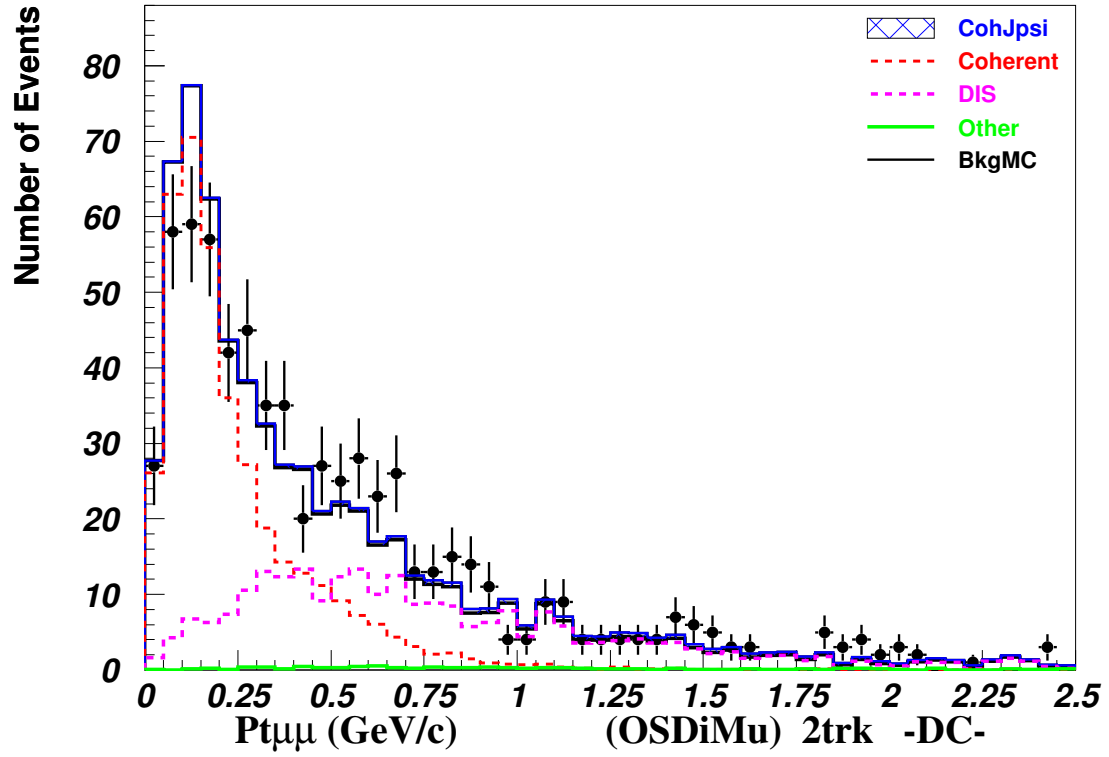
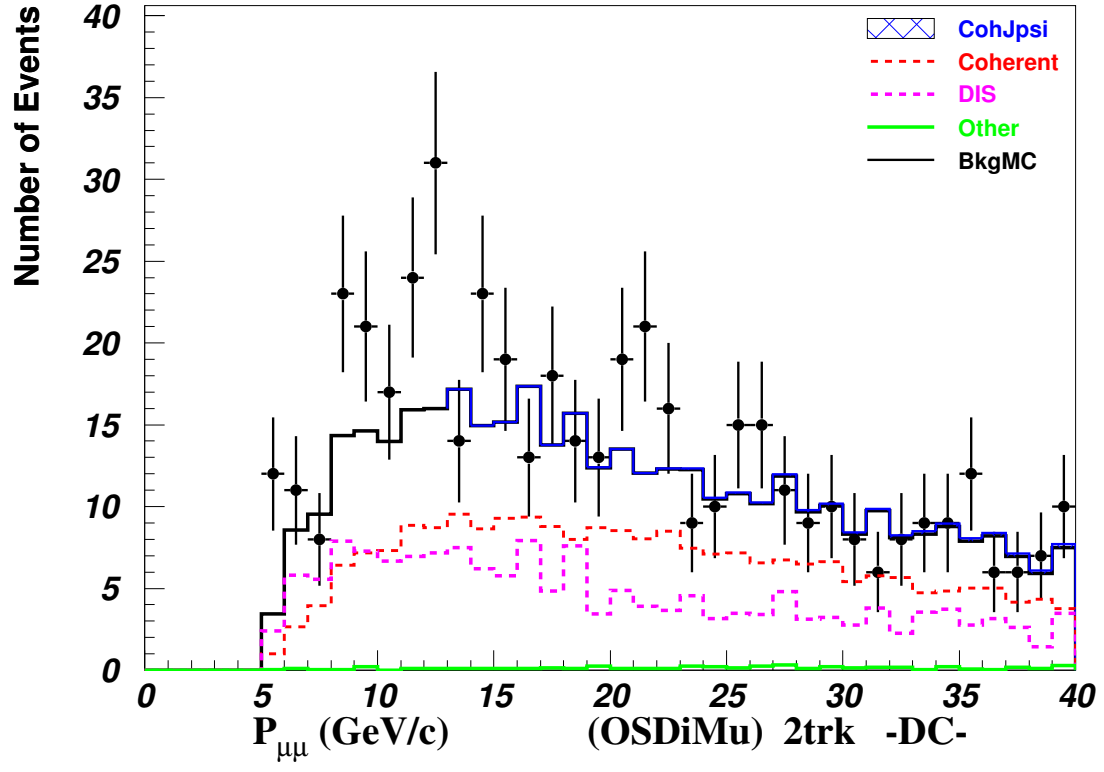


Figure 24: (./figs/p-pt-mumu.pdf)

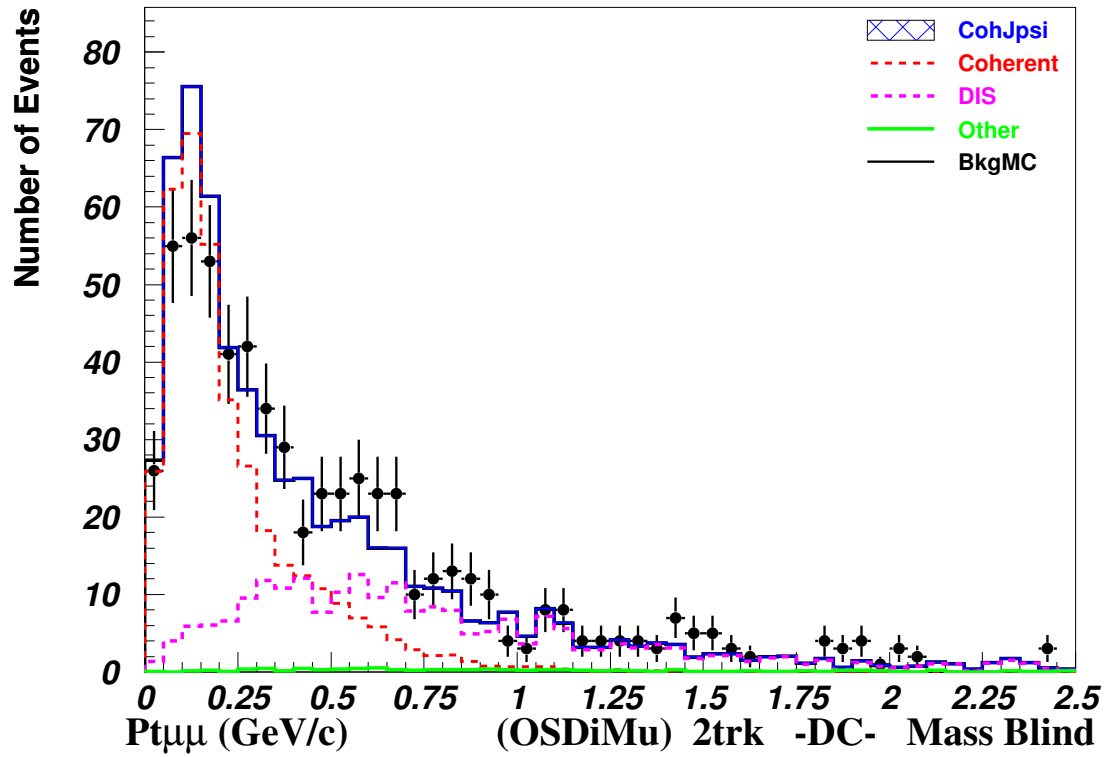
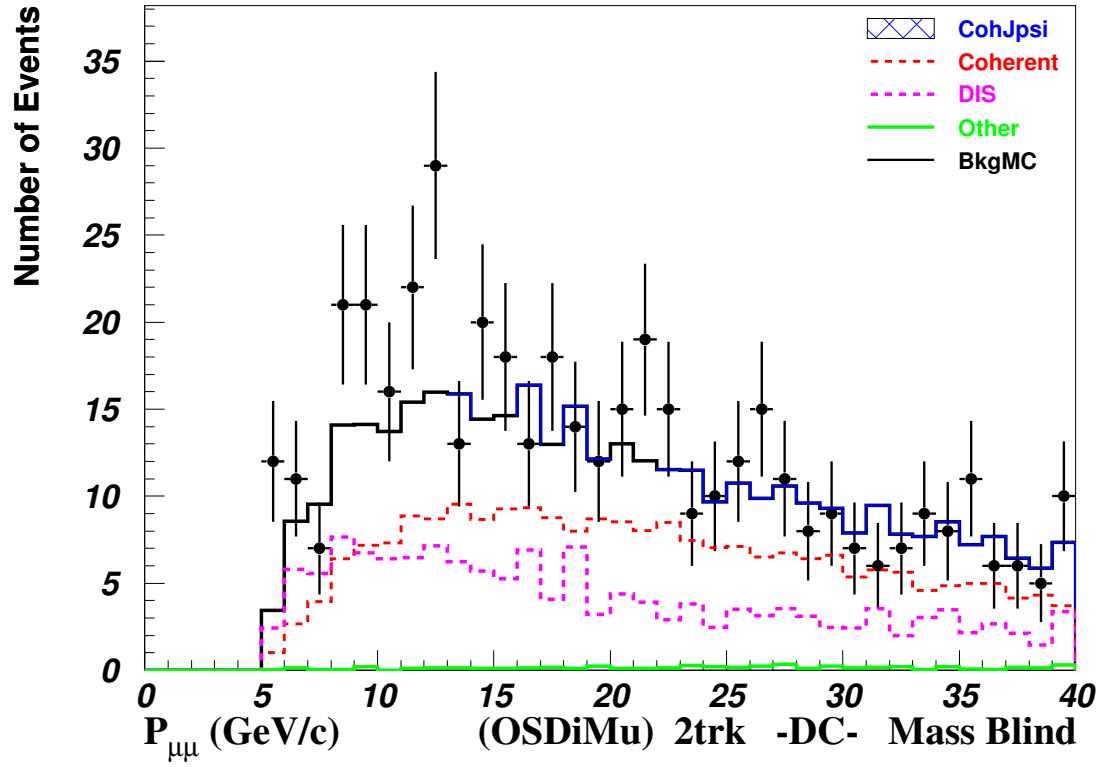


Figure 25: (./figs/p-pt-mumu-mb.pdf)

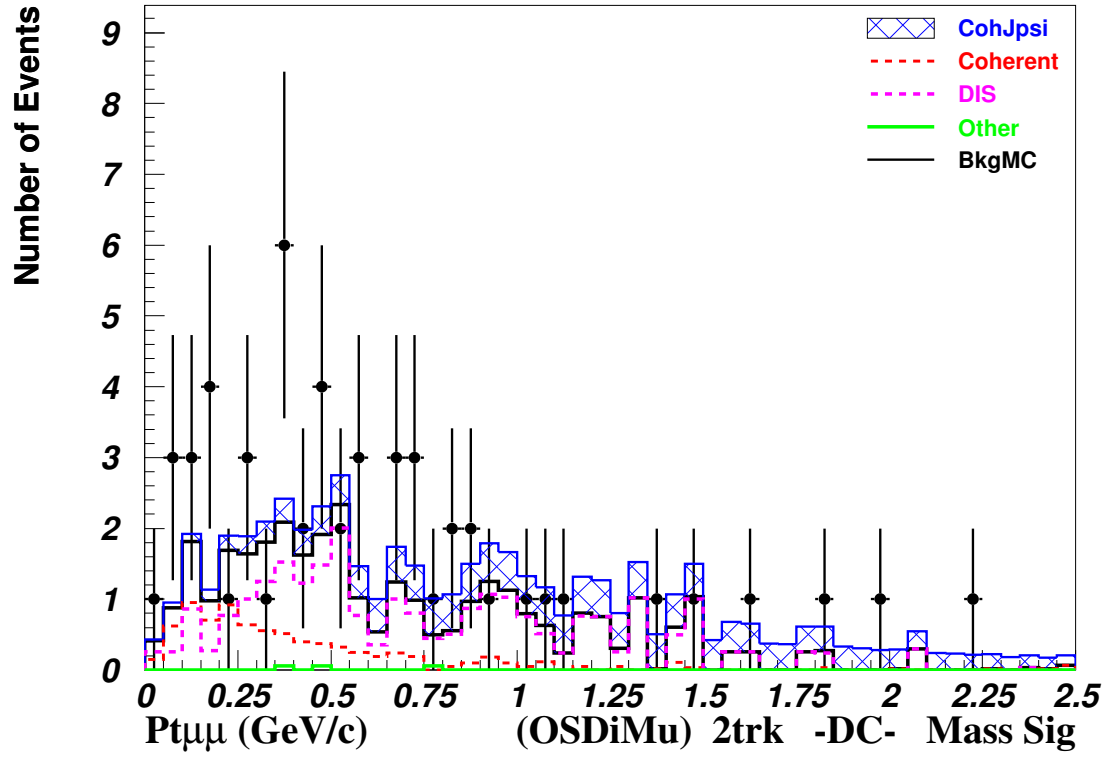
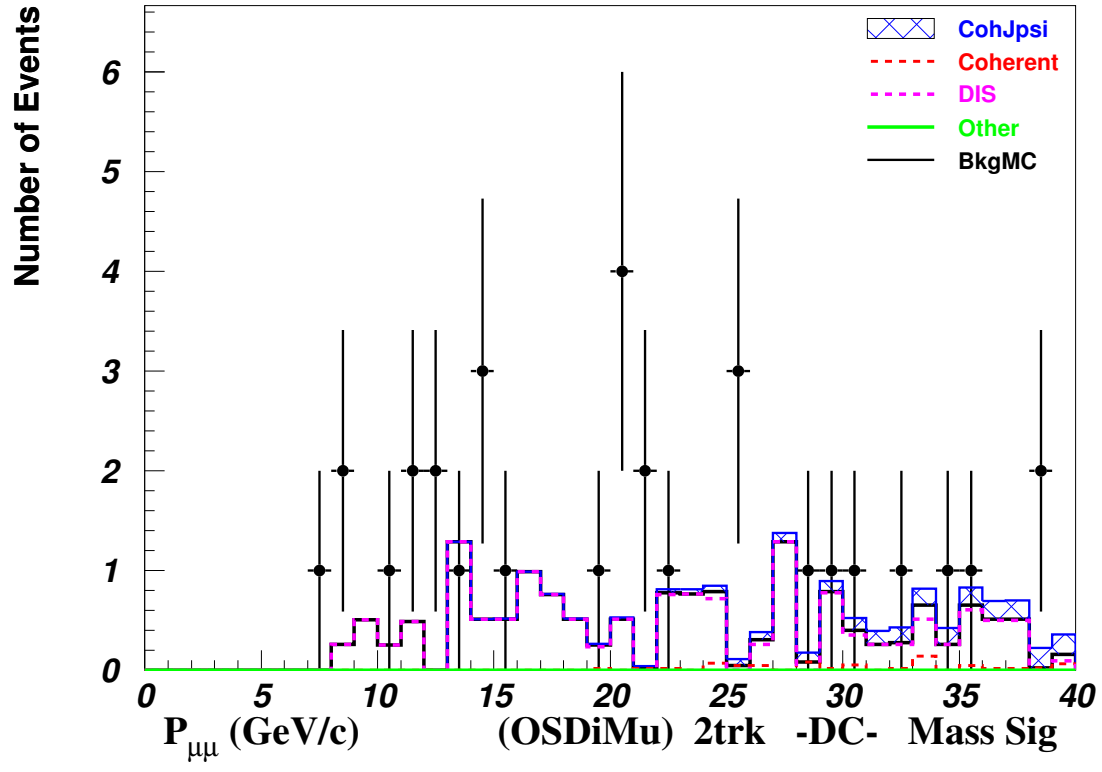


Figure 26: (./figs/p-pt-mumu-msig.pdf)

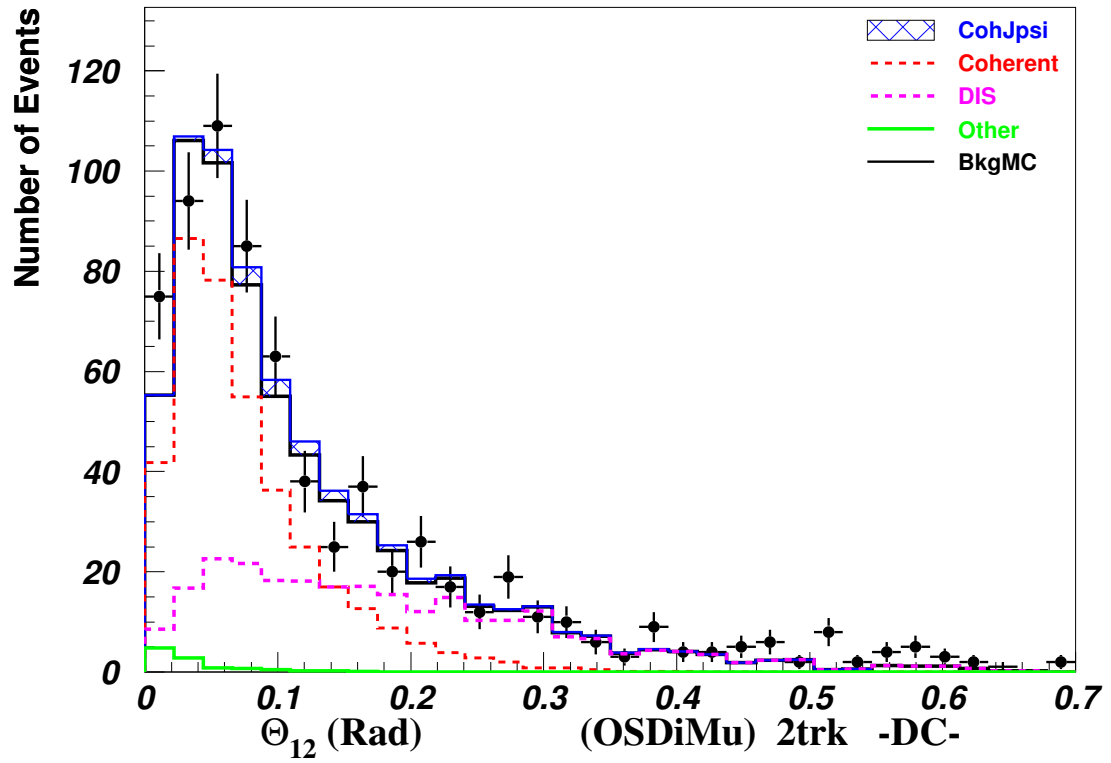
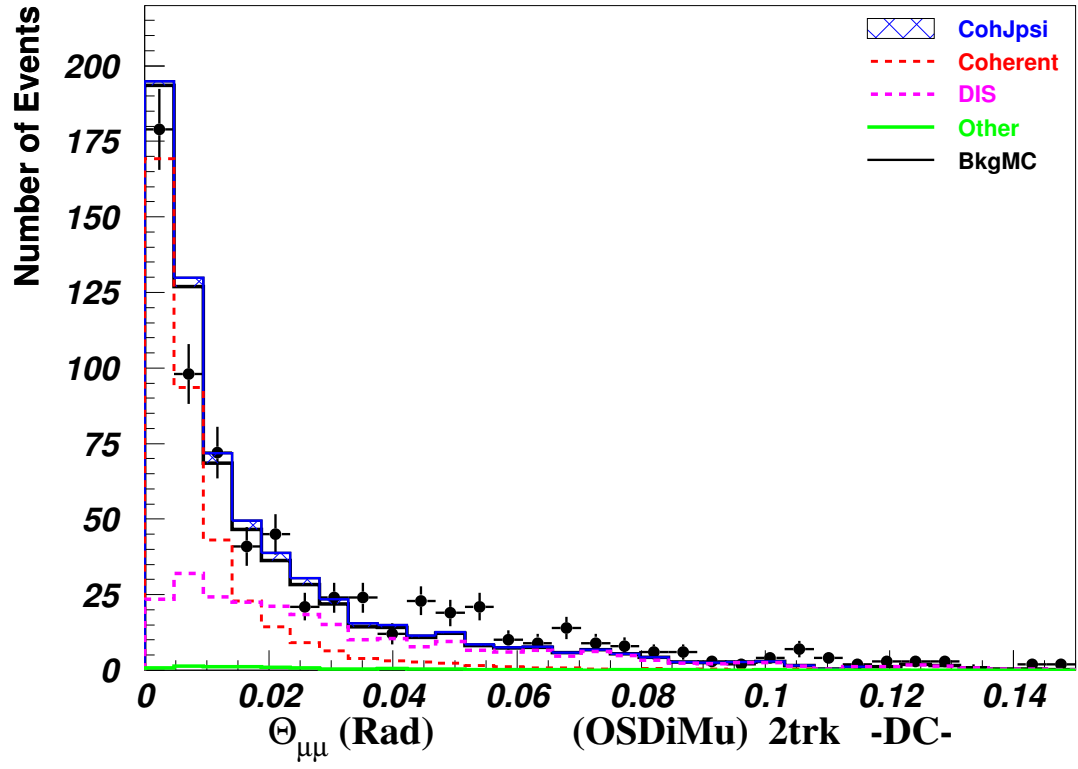


Figure 27: (./figs/thetamumu-theta12.pdf)

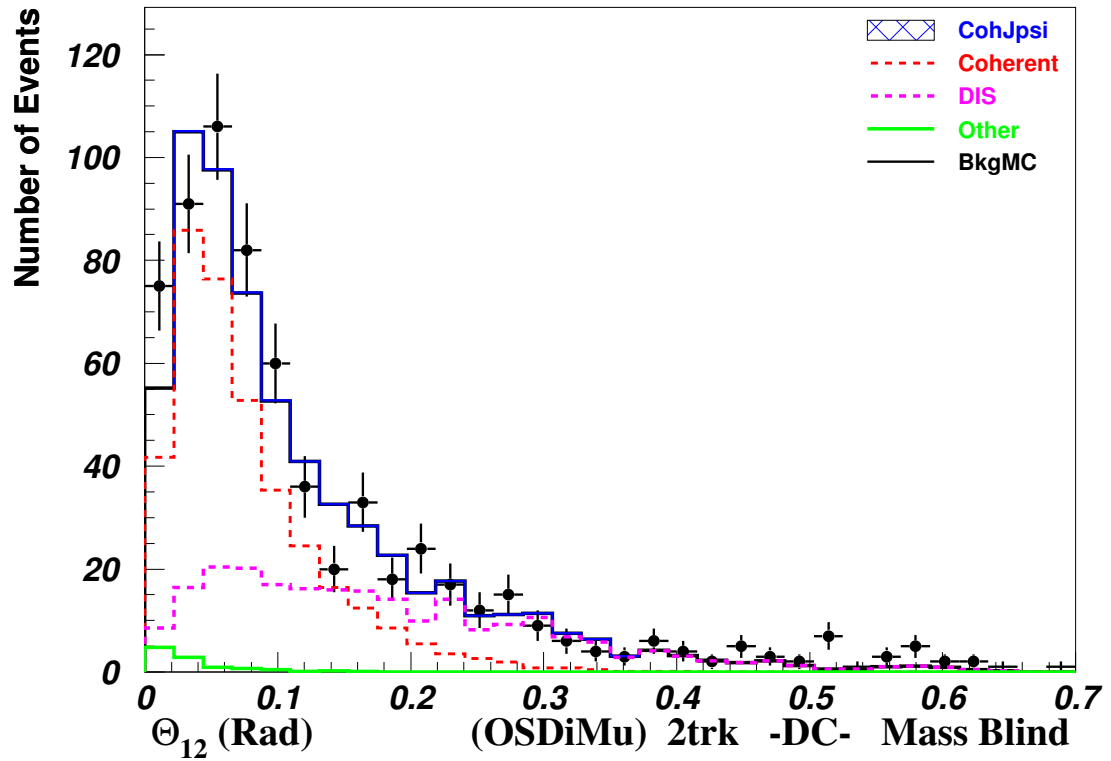
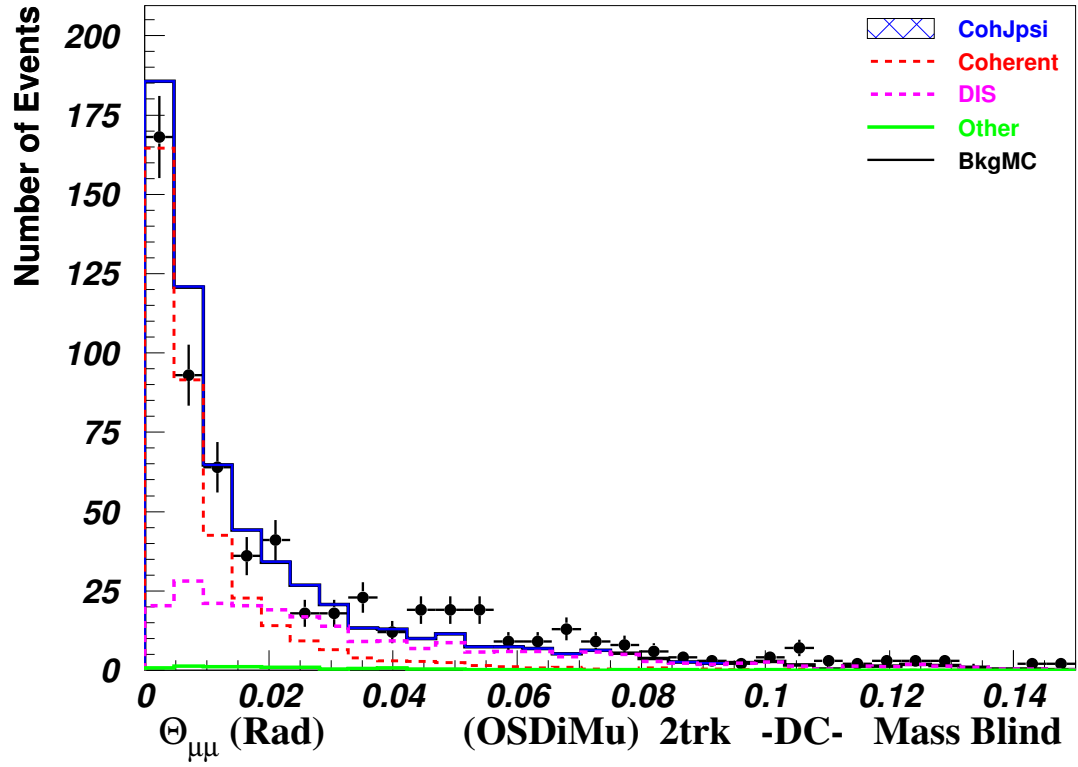


Figure 28: (./figs/thetamumu-theta12-mb.pdf)

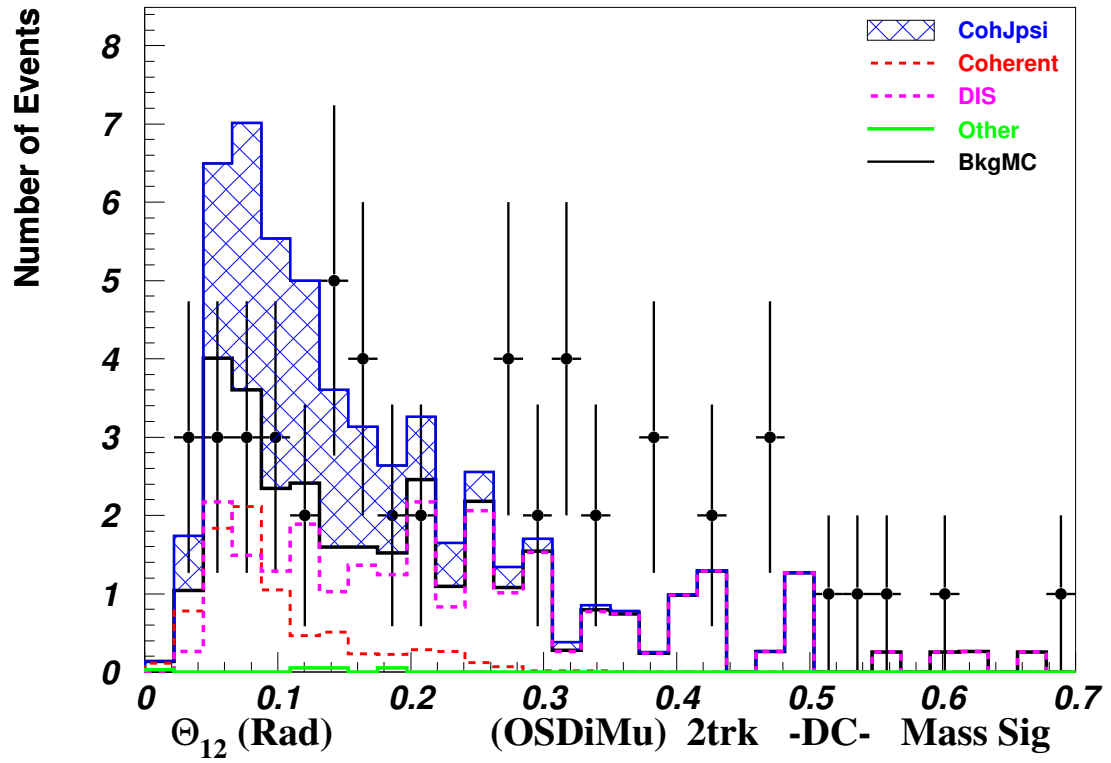
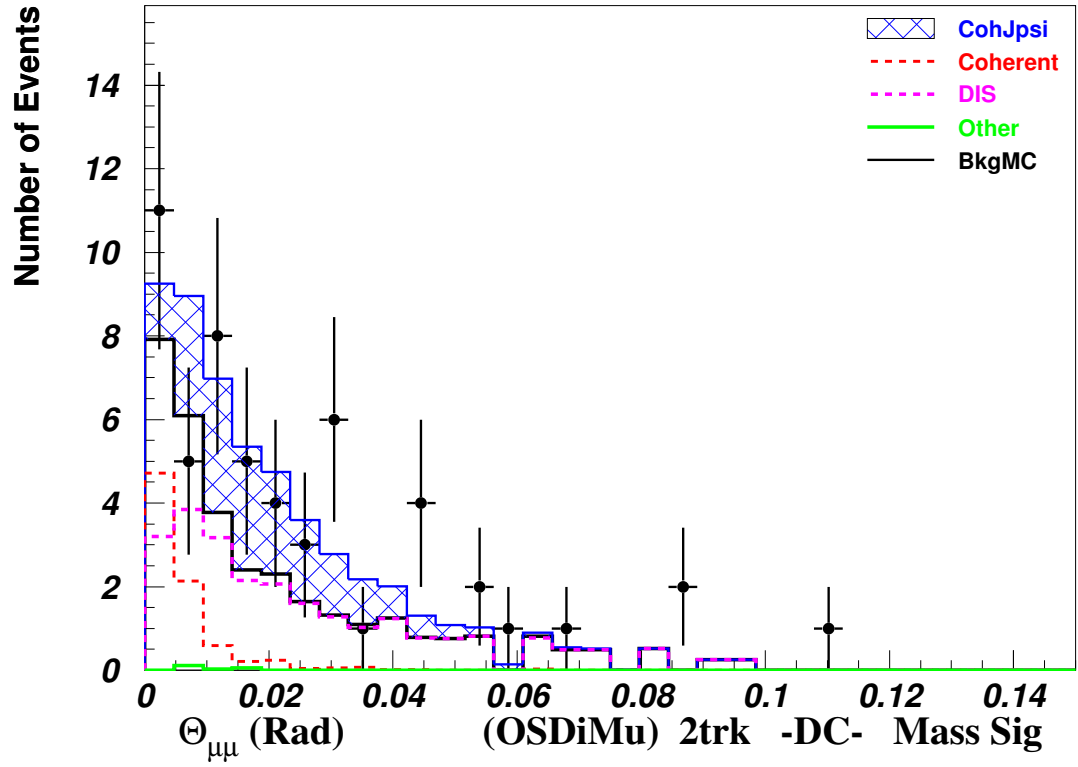


Figure 29: (./figs/thetamumu-theta12-msig.pdf)

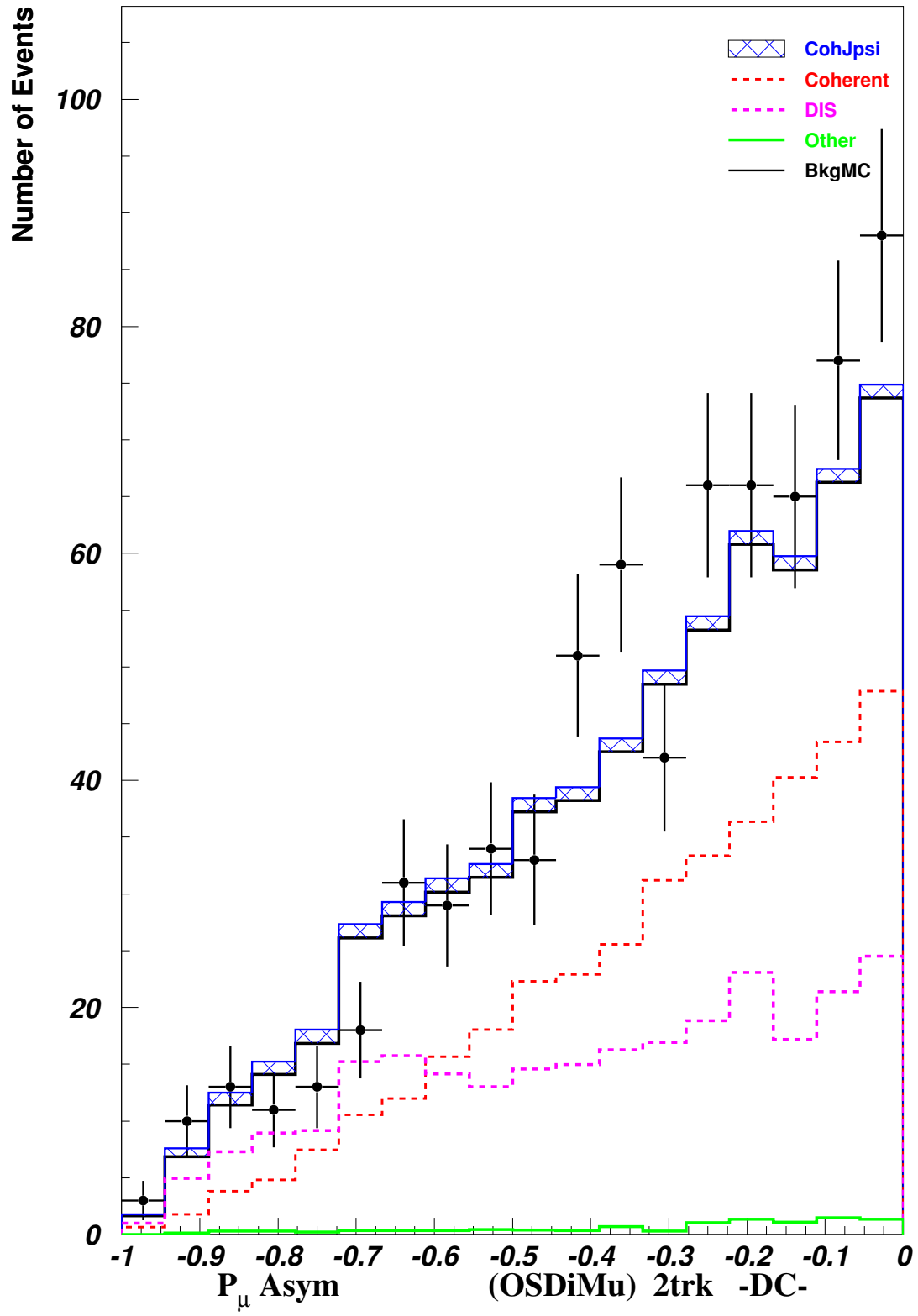


Figure 30: (./figs/pasym.pdf)

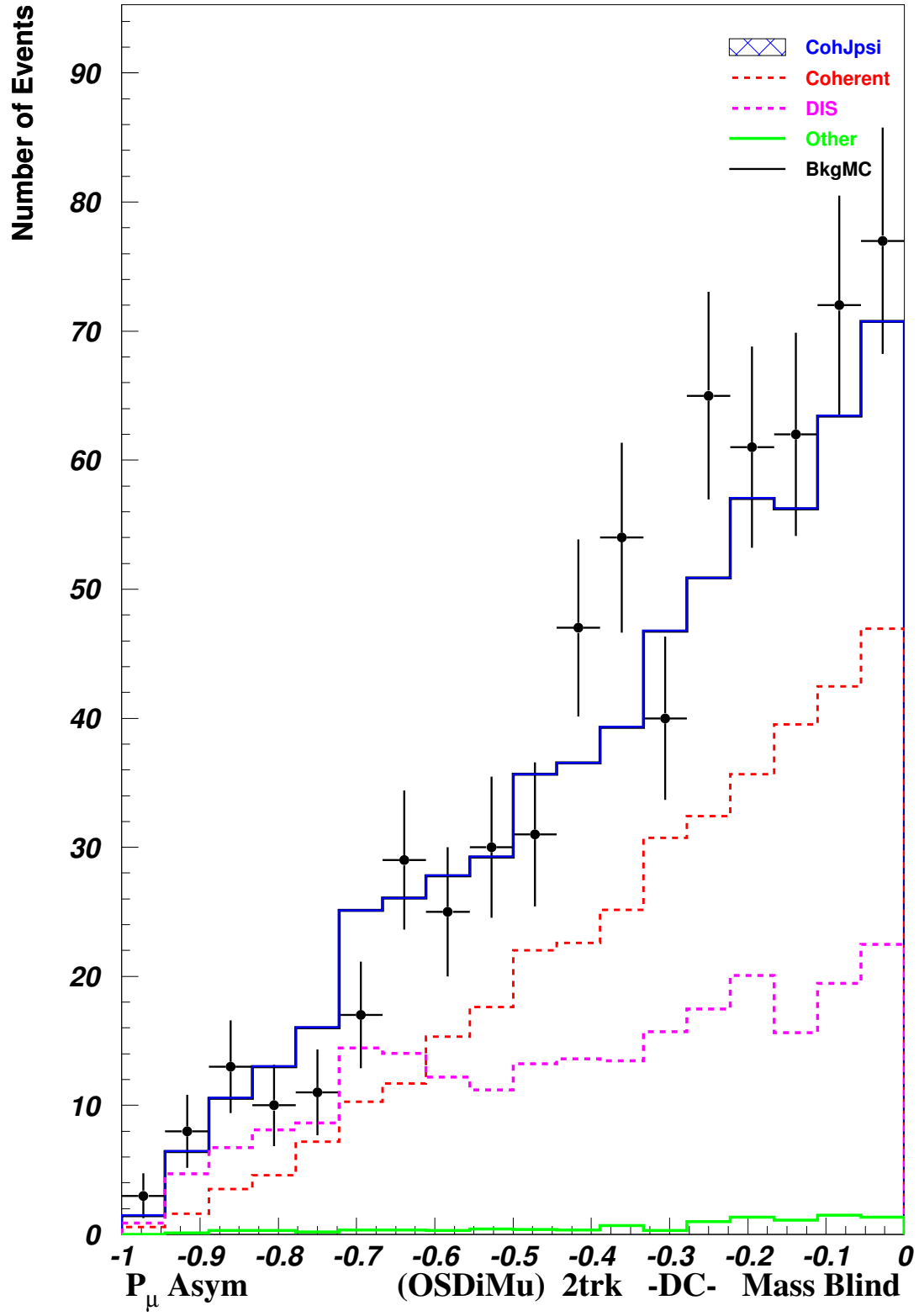


Figure 31: (./figs/pasym-mb.pdf)

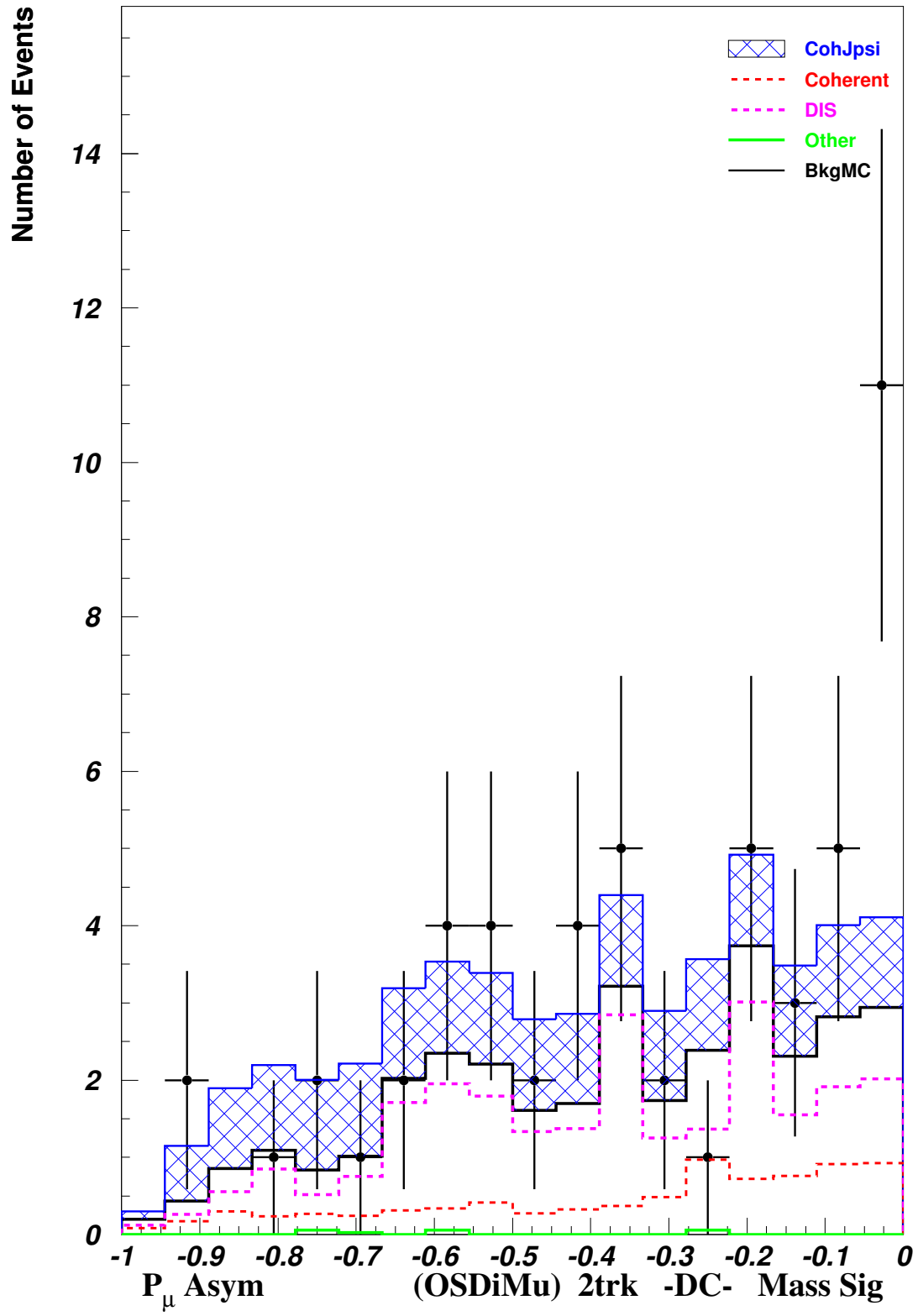


Figure 32: (./figs/pasym-msig.pdf)

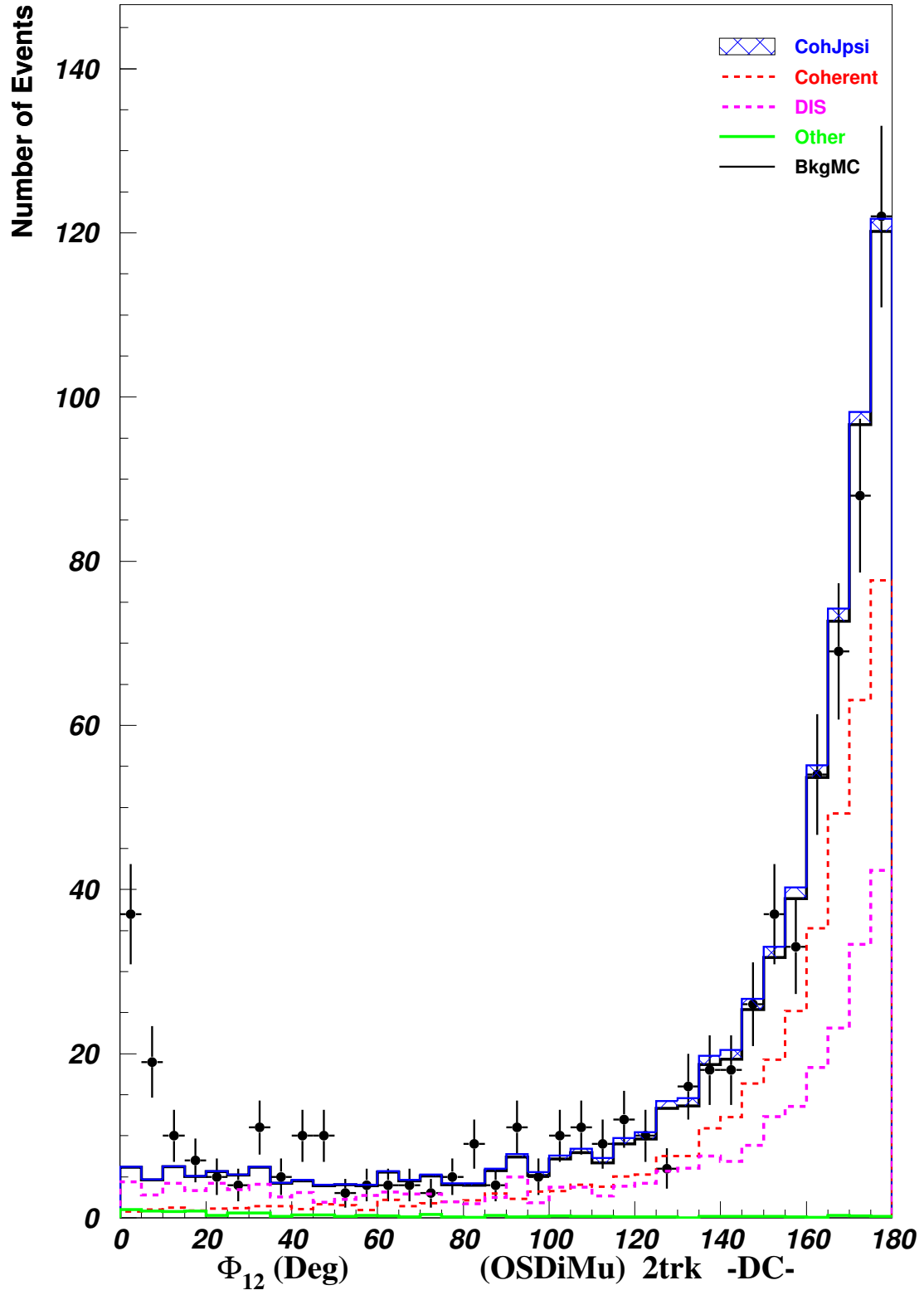


Figure 33: (./figs/phi12.pdf)

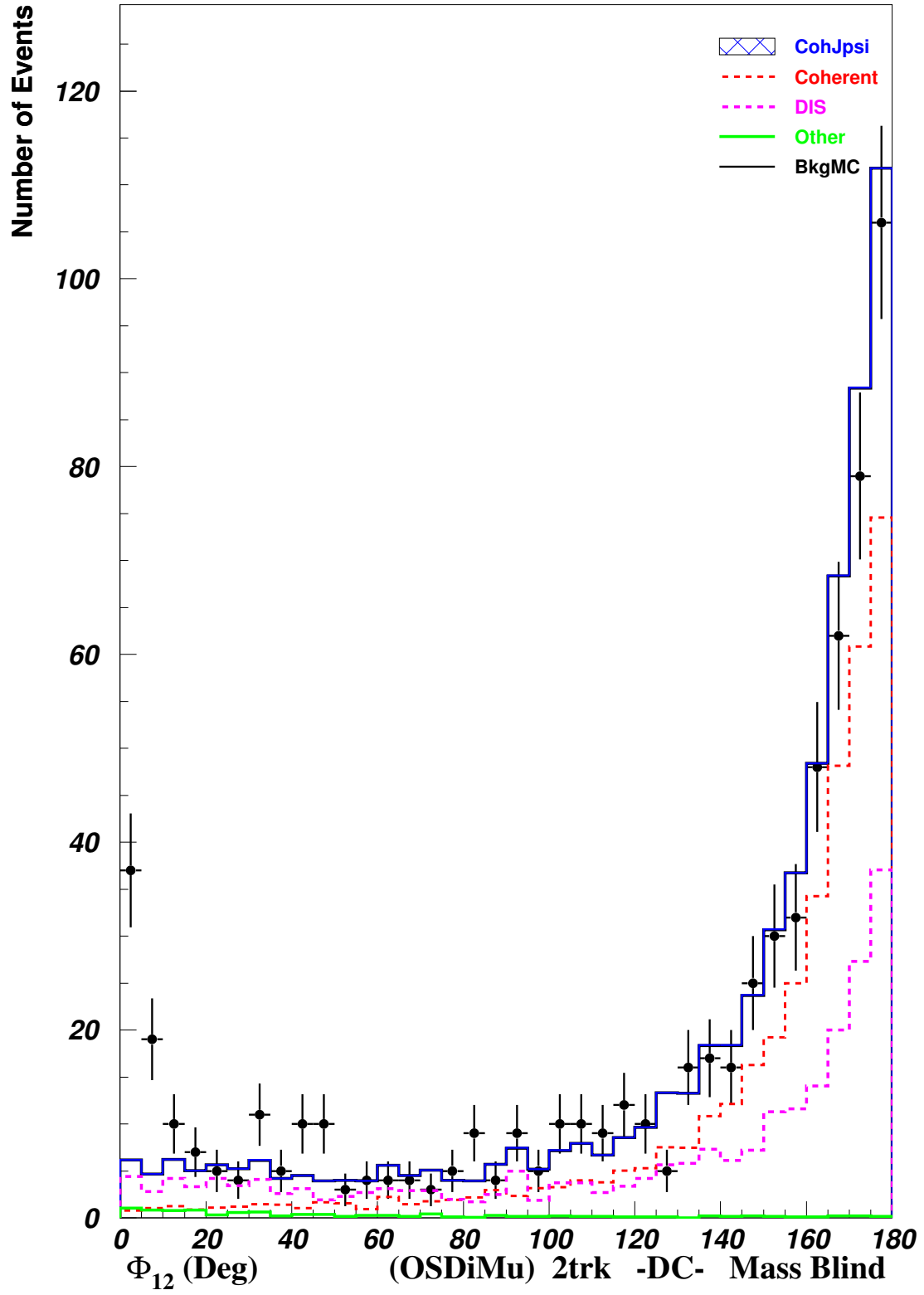


Figure 34: (./figs/phi12-mb.pdf)

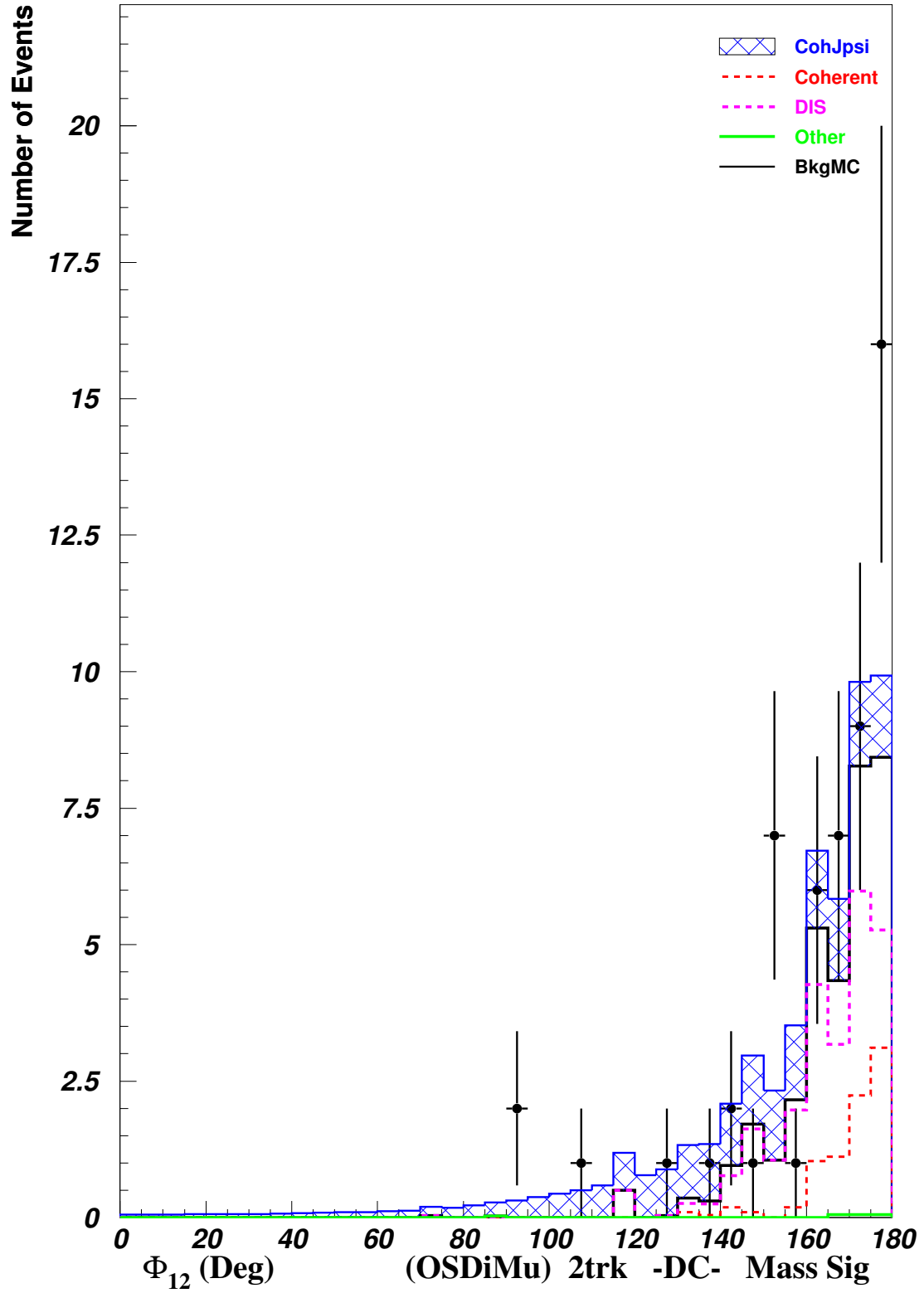


Figure 35: (./figs/phi12-msig.pdf)

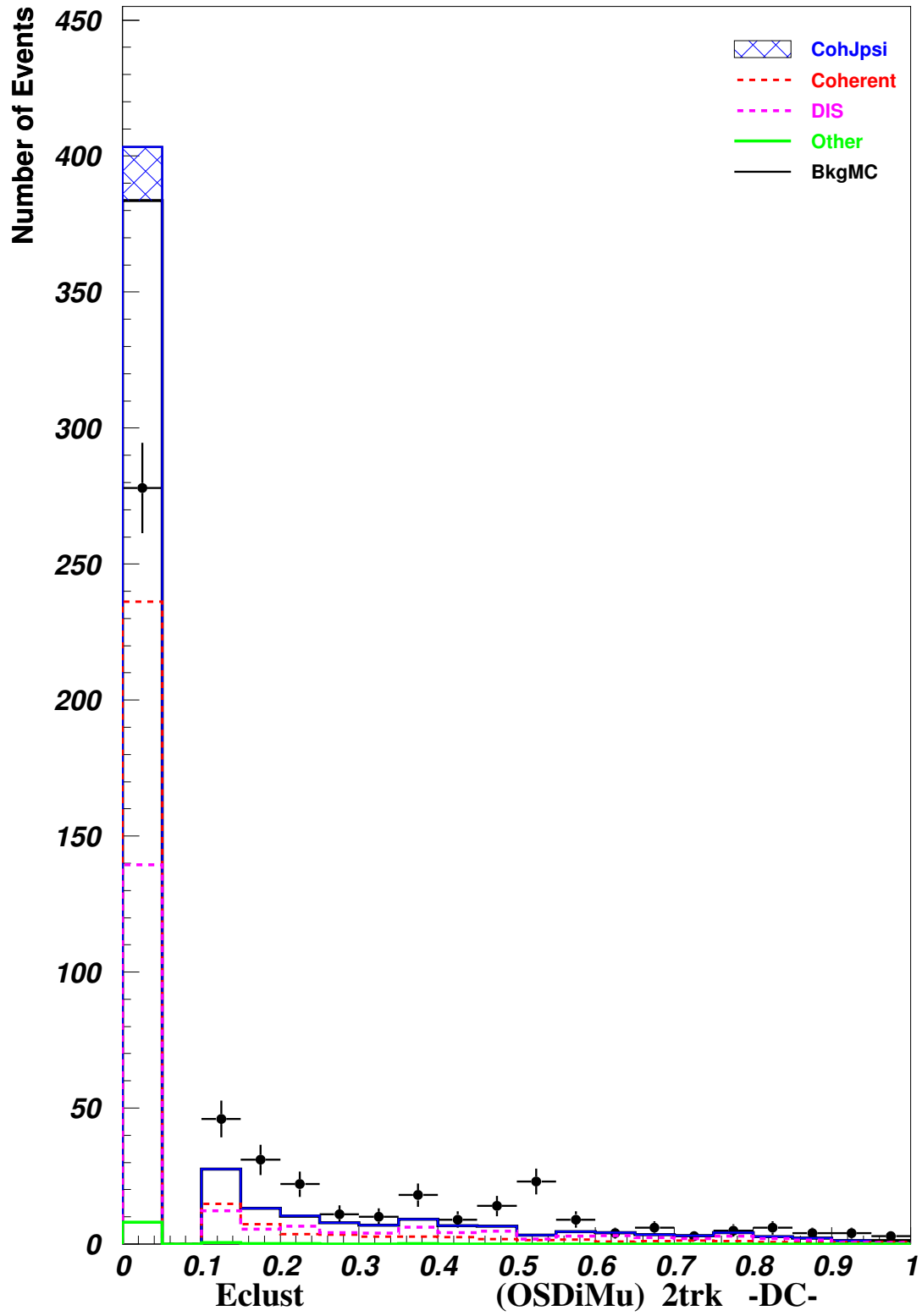


Figure 36: (./figs/eneut.pdf)

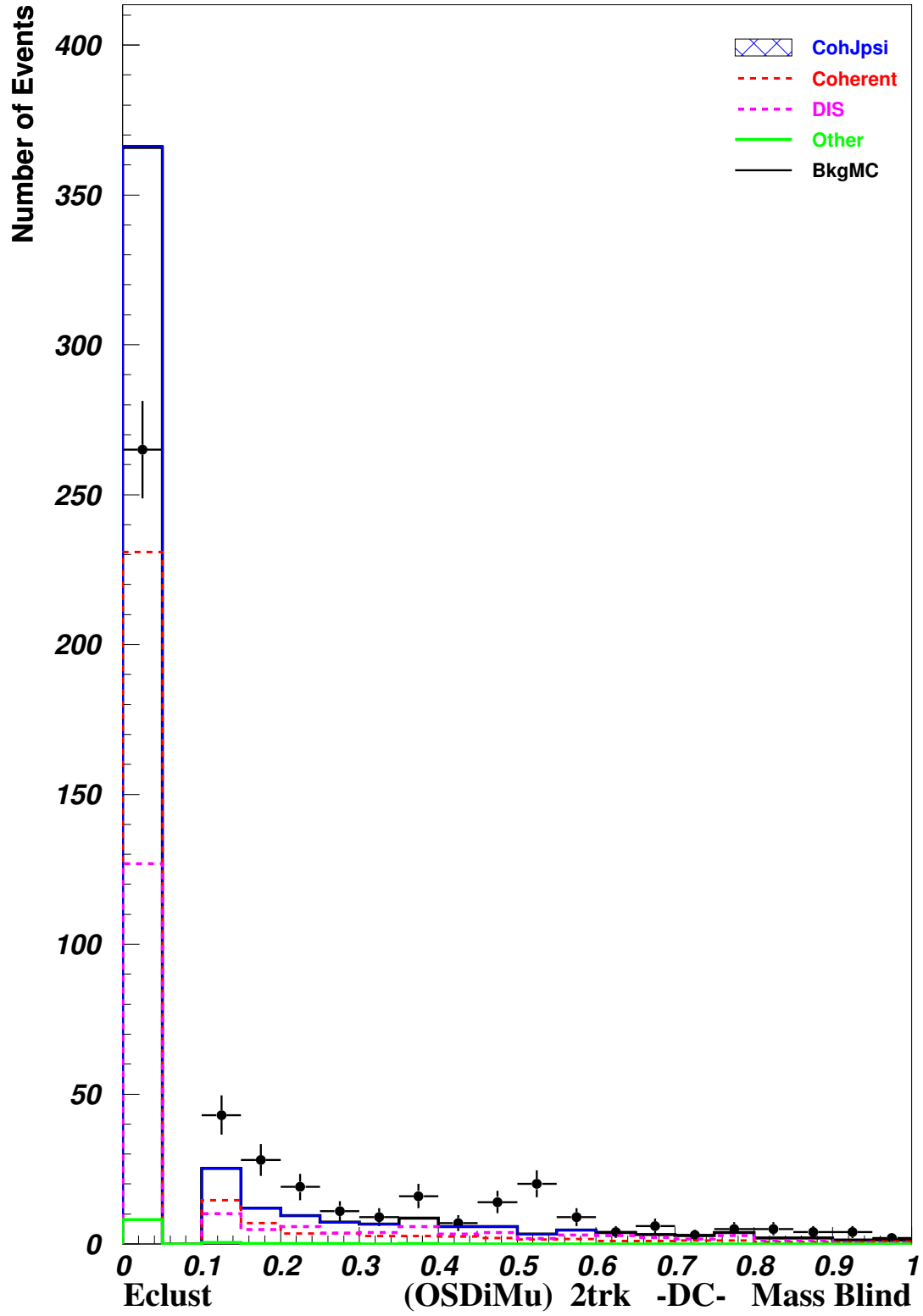


Figure 37: (./figs/eneut-mb.pdf)

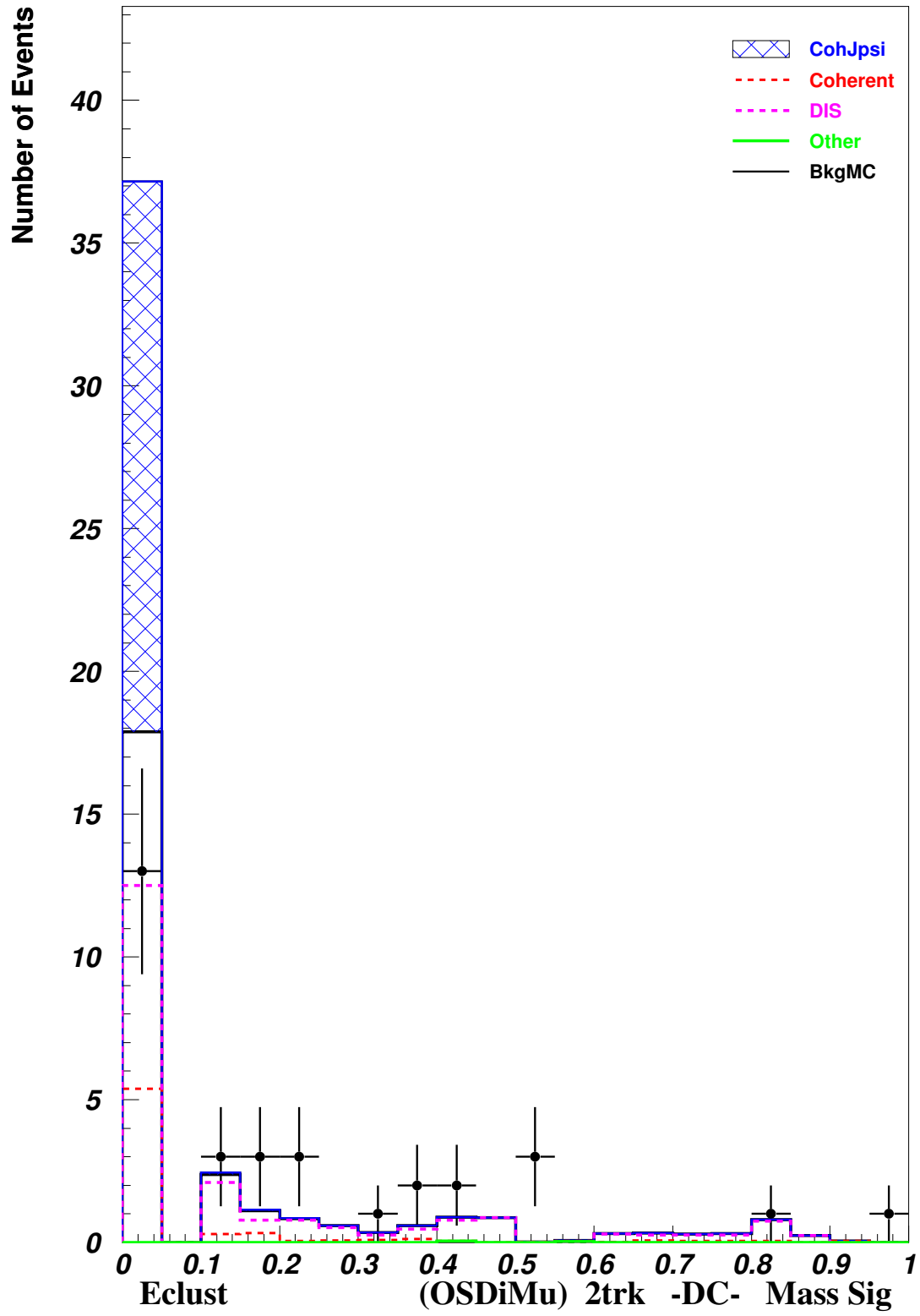


Figure 38: (./figs/eneut-msig.pdf)

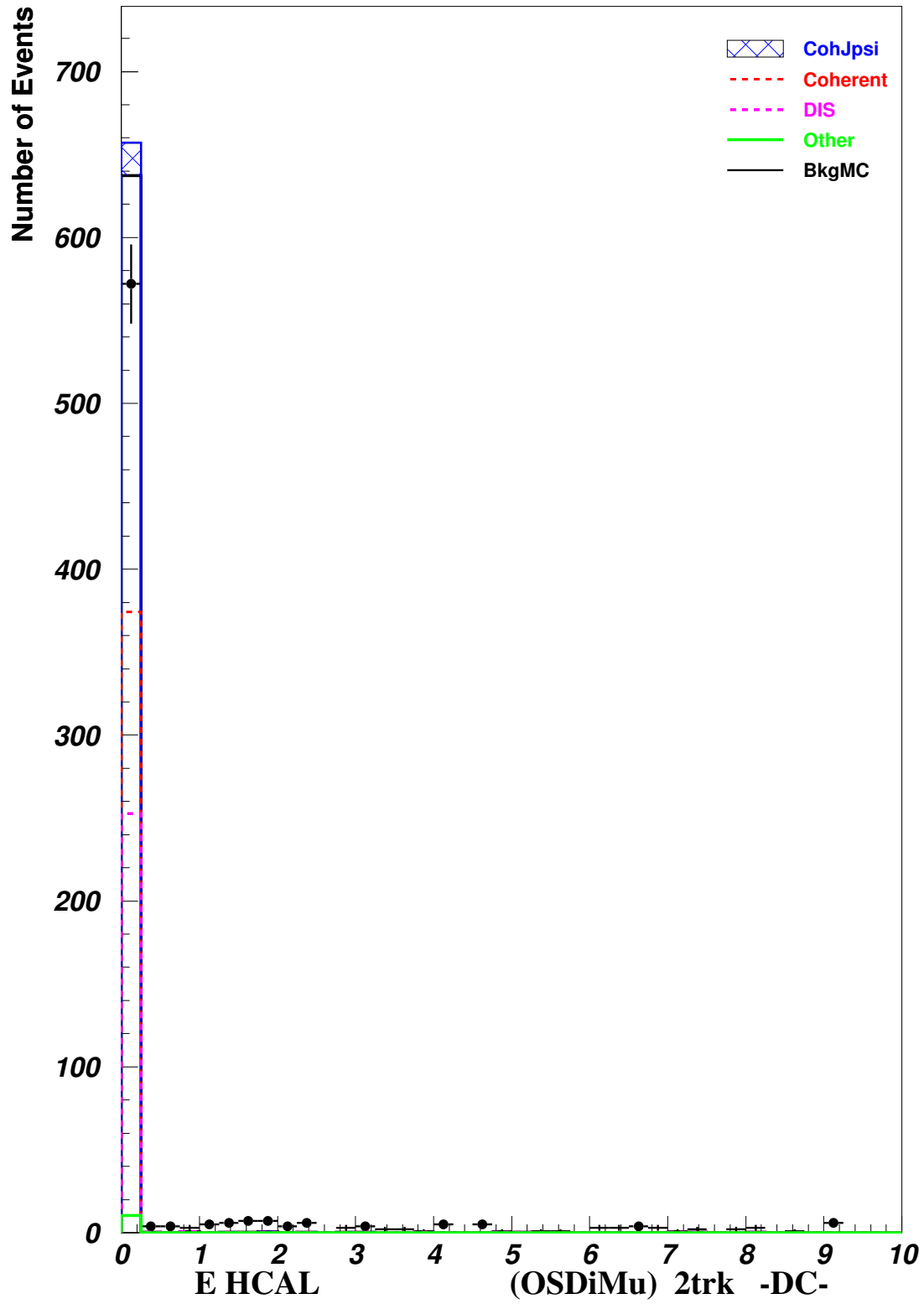


Figure 39: (./figs/ehcal.pdf)

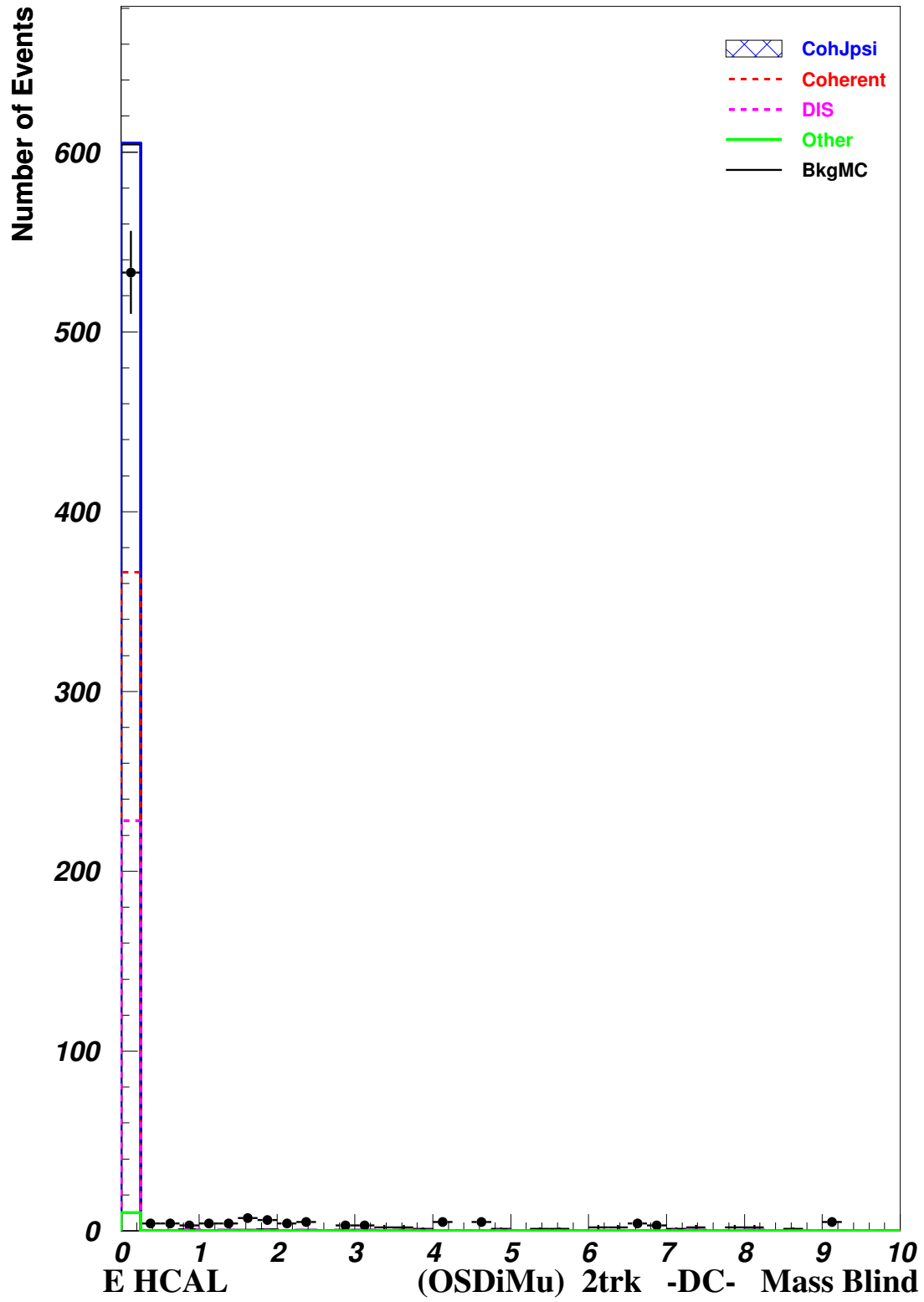


Figure 40: (./figs/ehcal-mb.pdf)

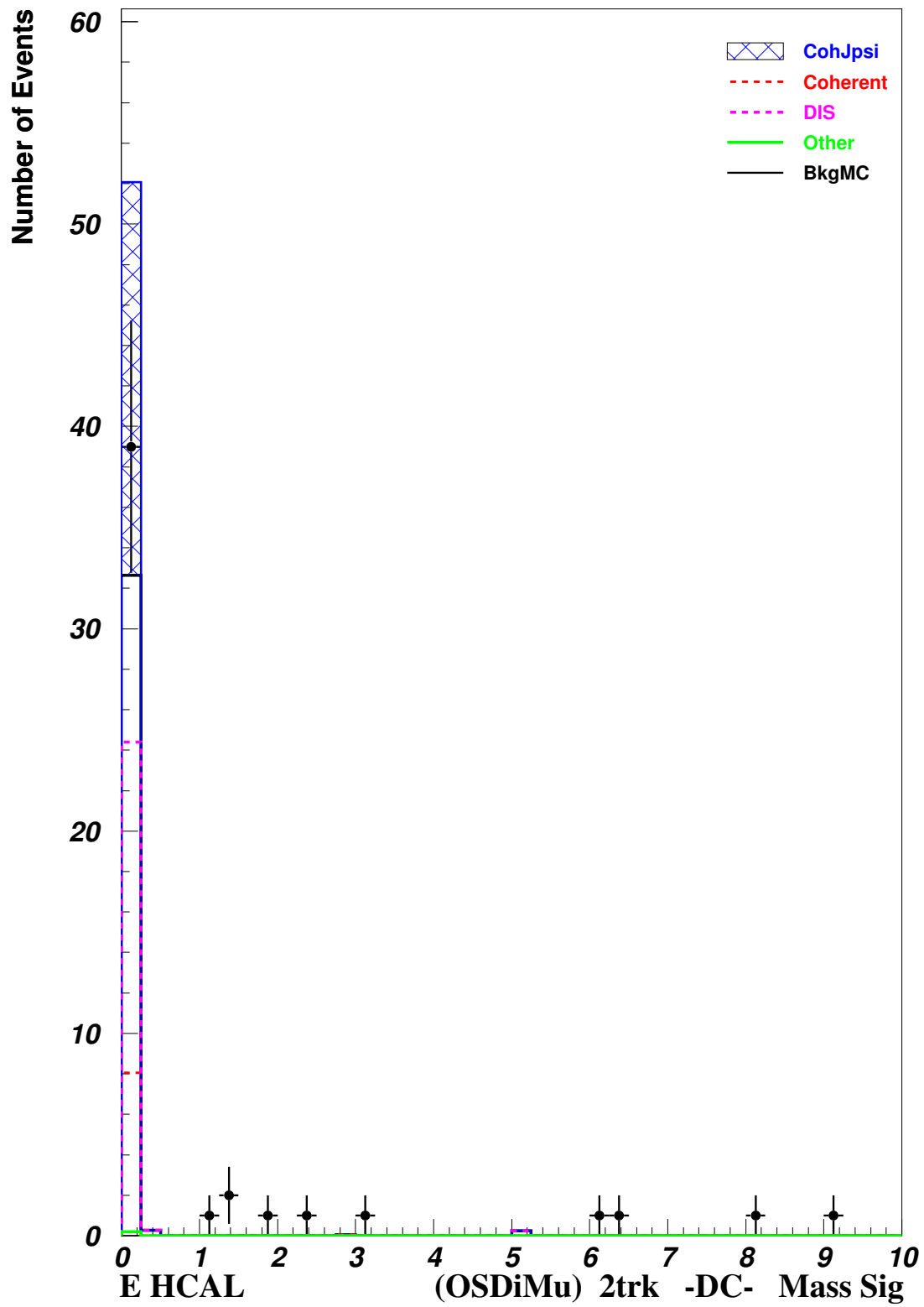


Figure 41: (./figs/ehcal-msig.pdf)

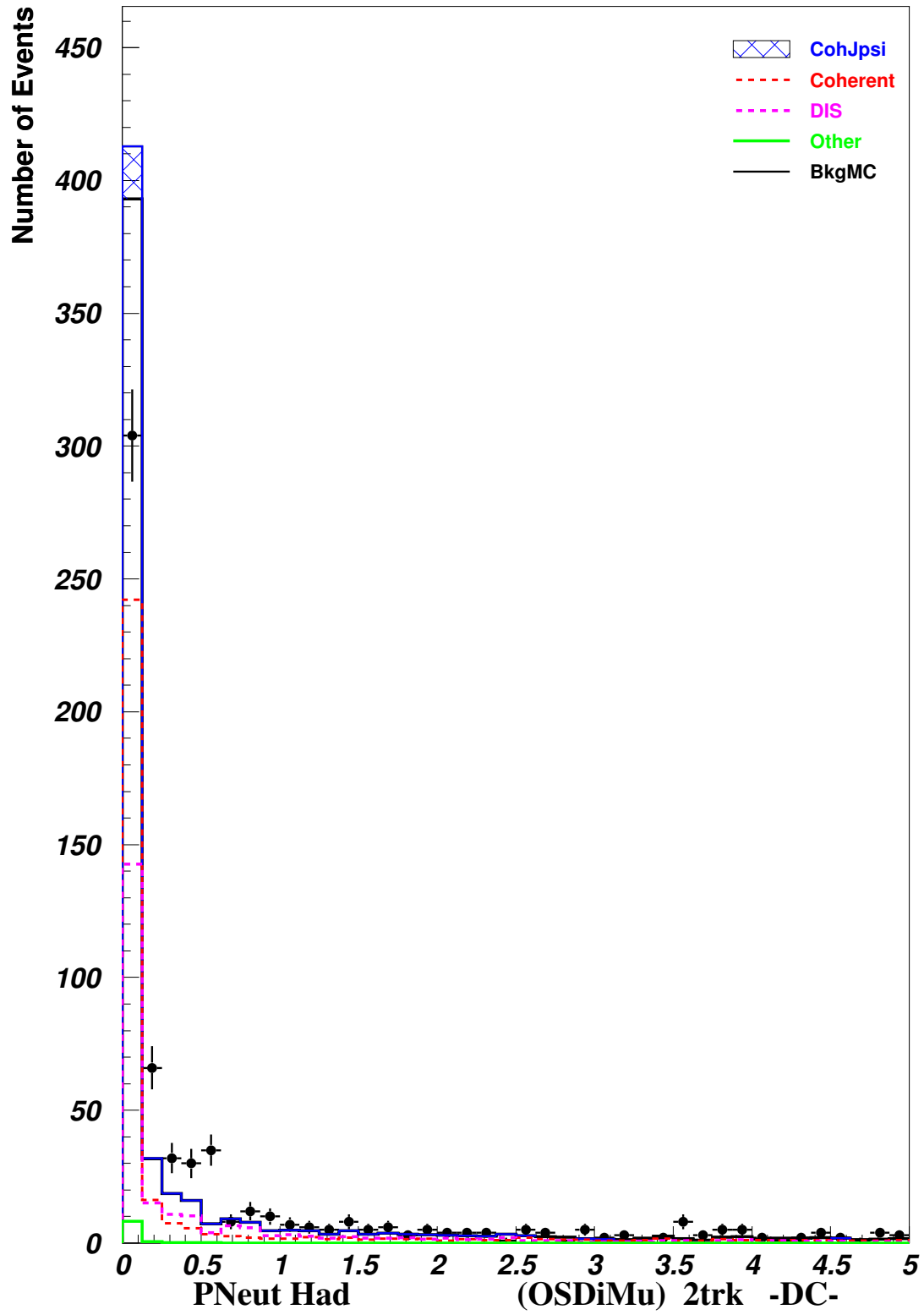


Figure 42: (./figs/pneuth.pdf)

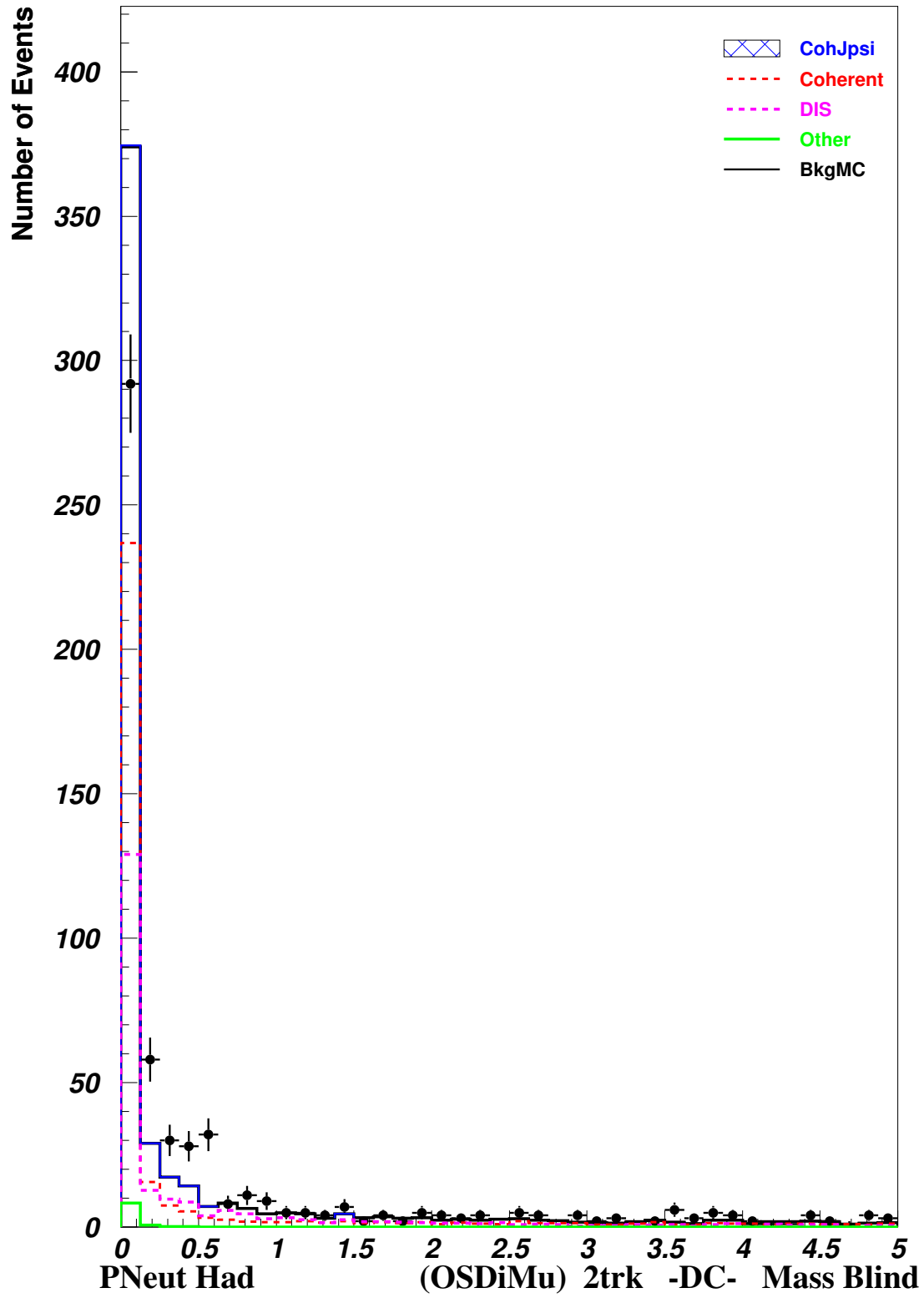


Figure 43: (./figs/pneuth-mb.pdf)

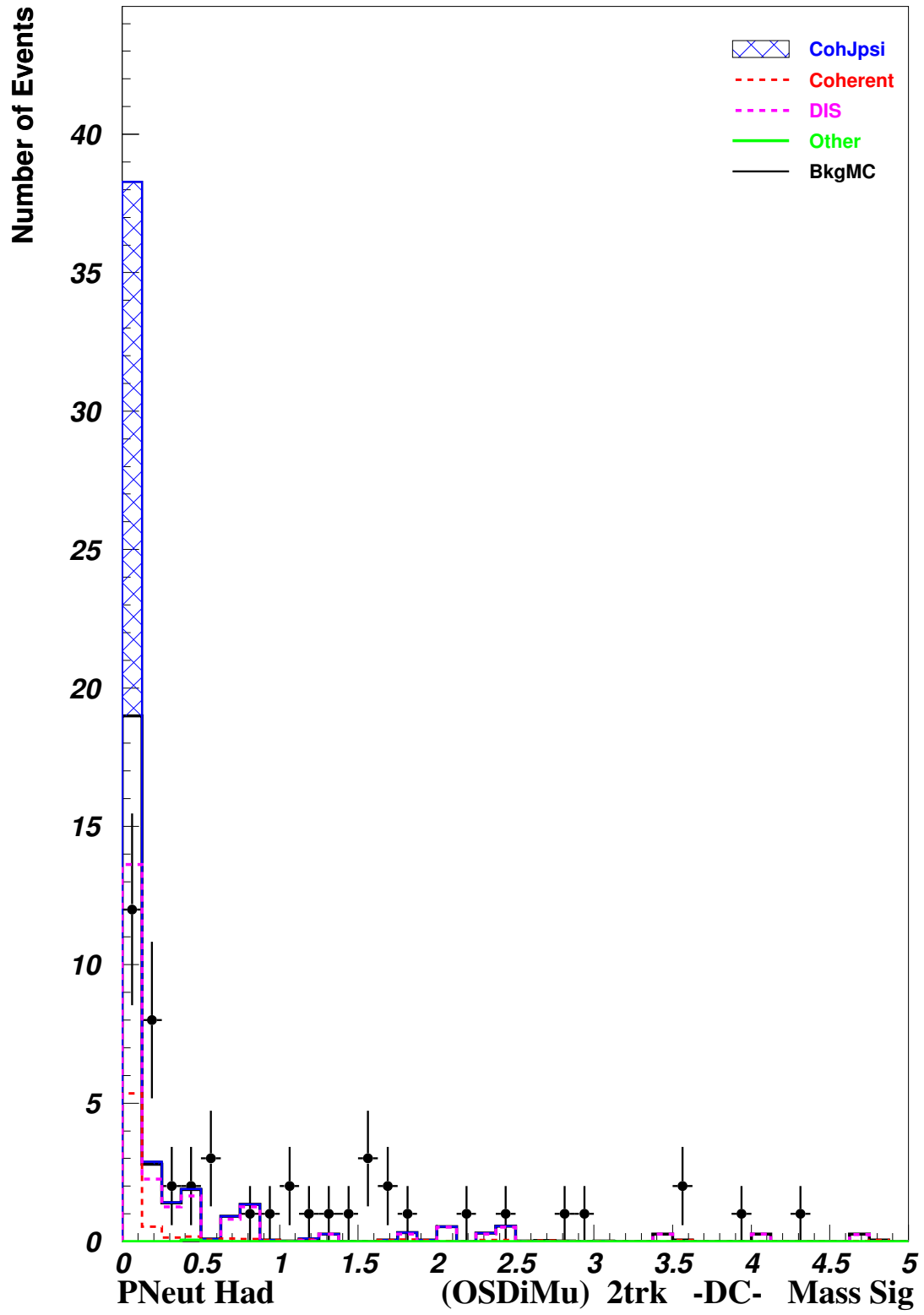


Figure 44: (./figs/pneuth-msig.pdf)

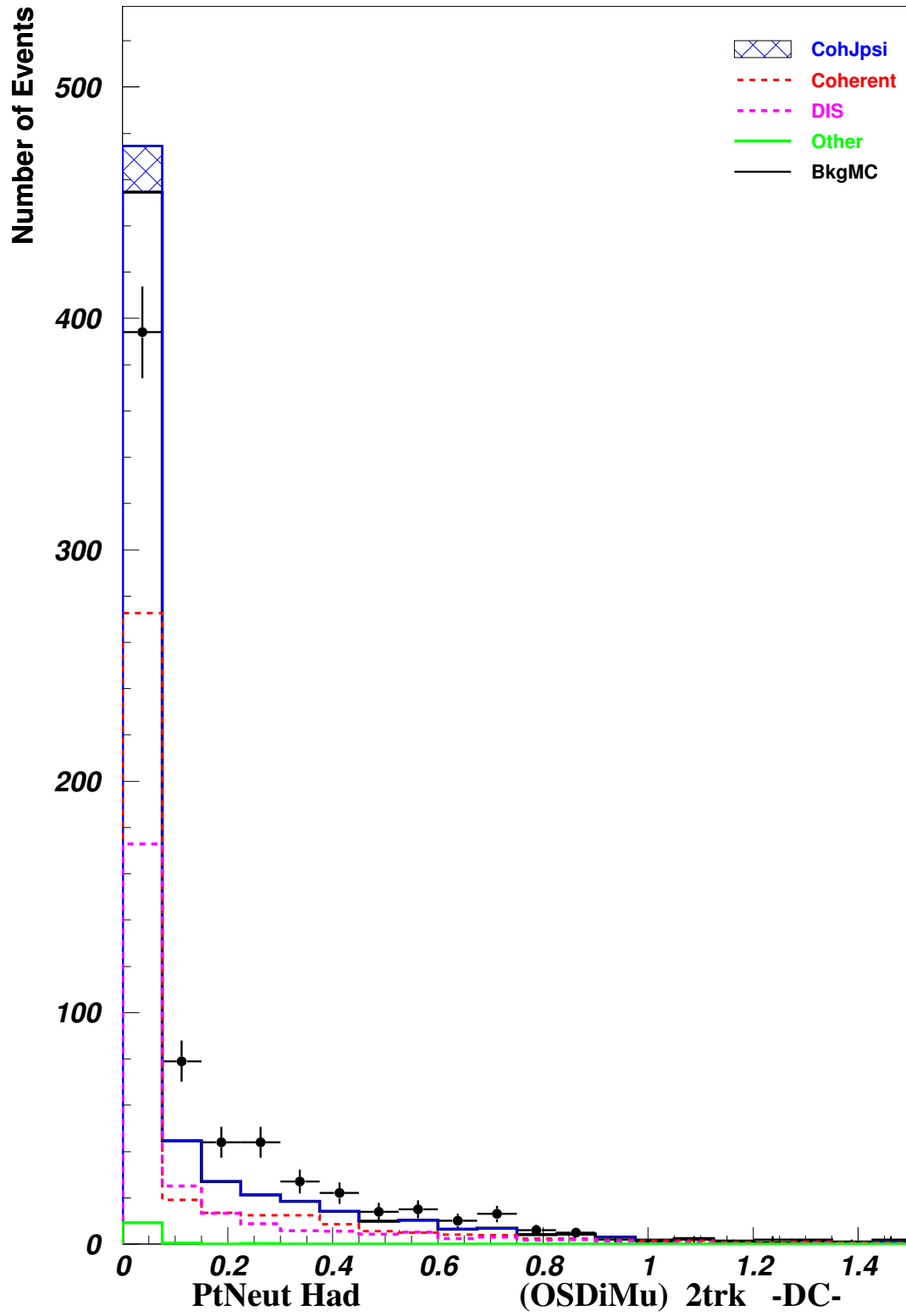


Figure 45: (./figs/ptneuth.pdf)

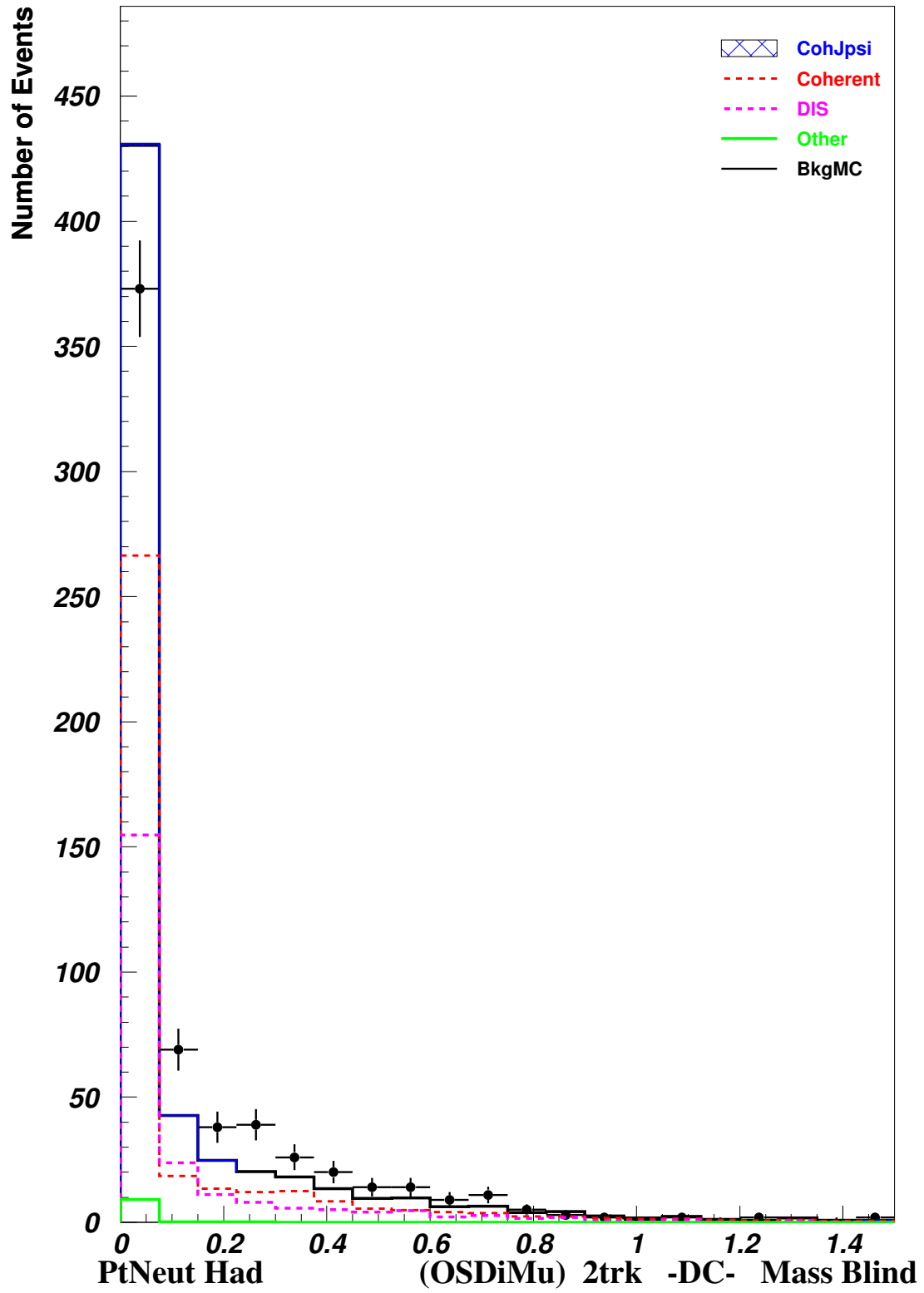


Figure 46: (./figs/ptneuth-mb.pdf)

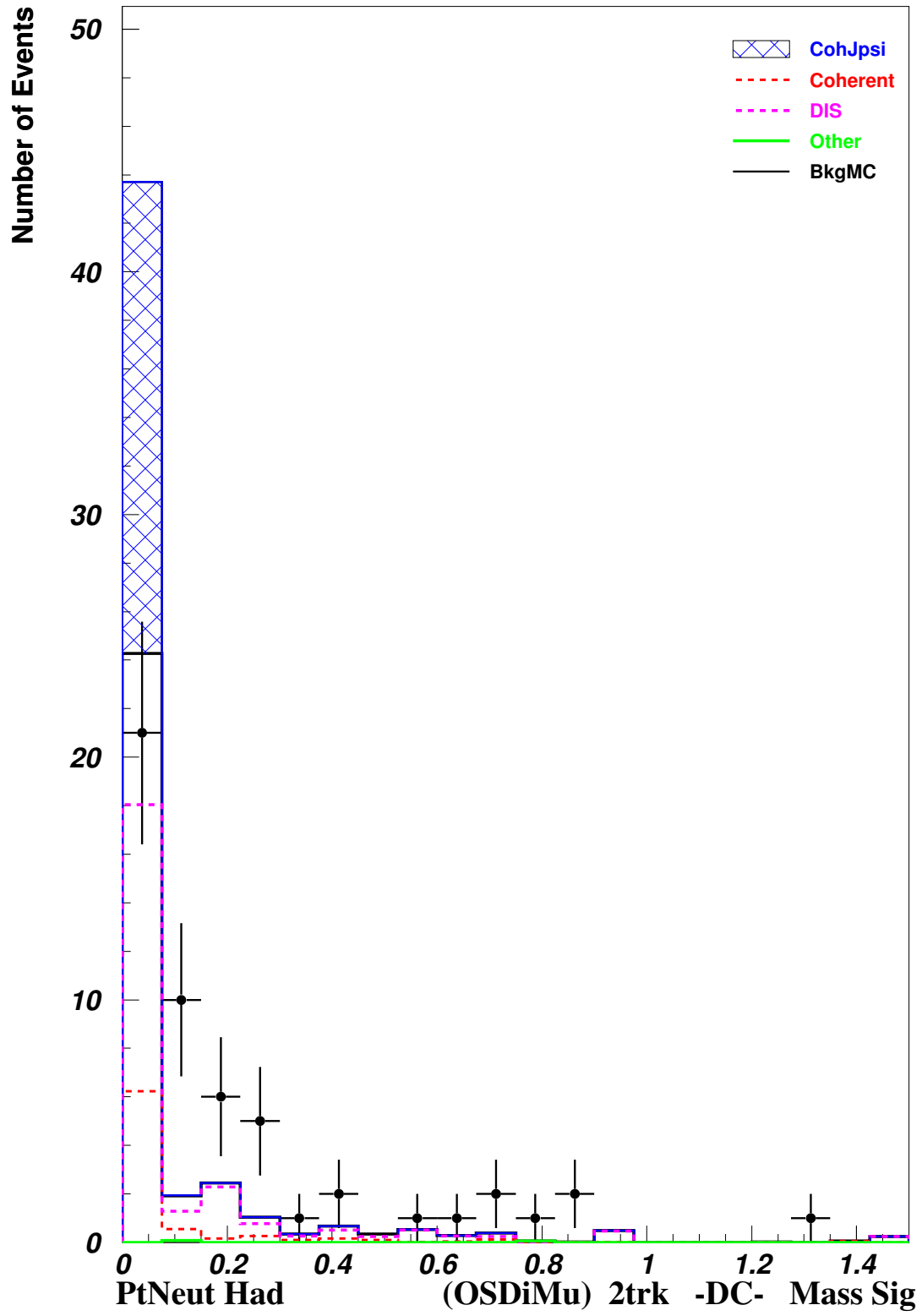


Figure 47: (./figs/ptneuth-msig.pdf)

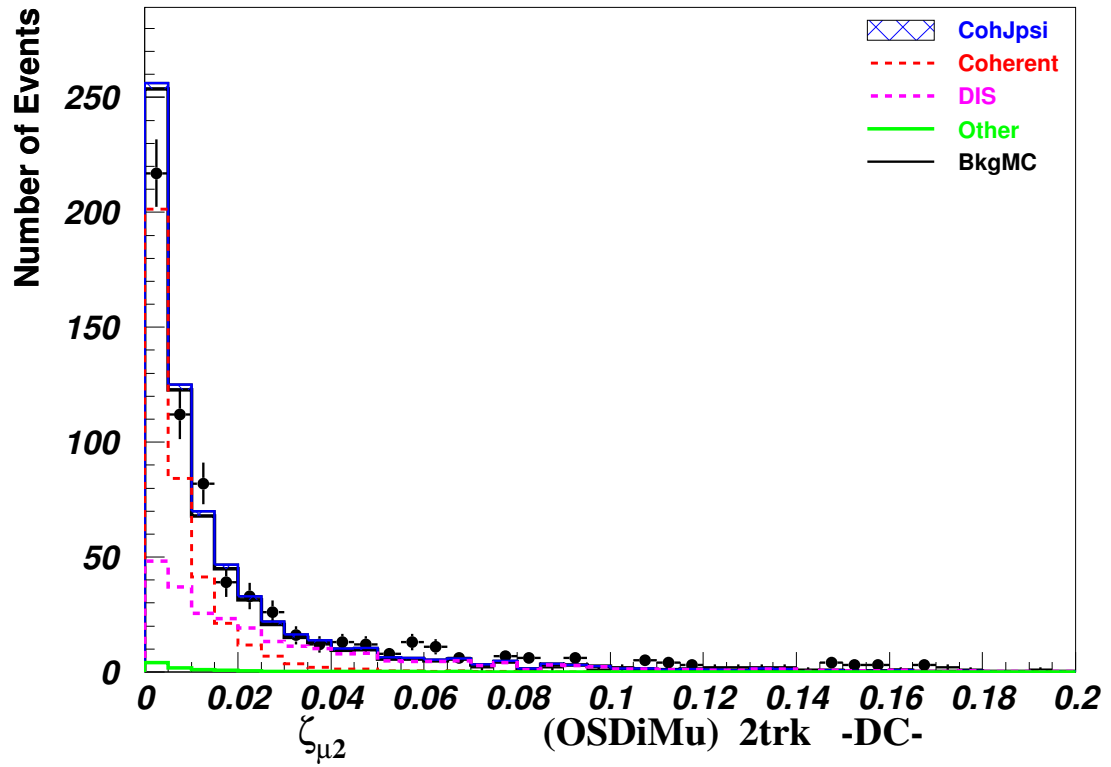
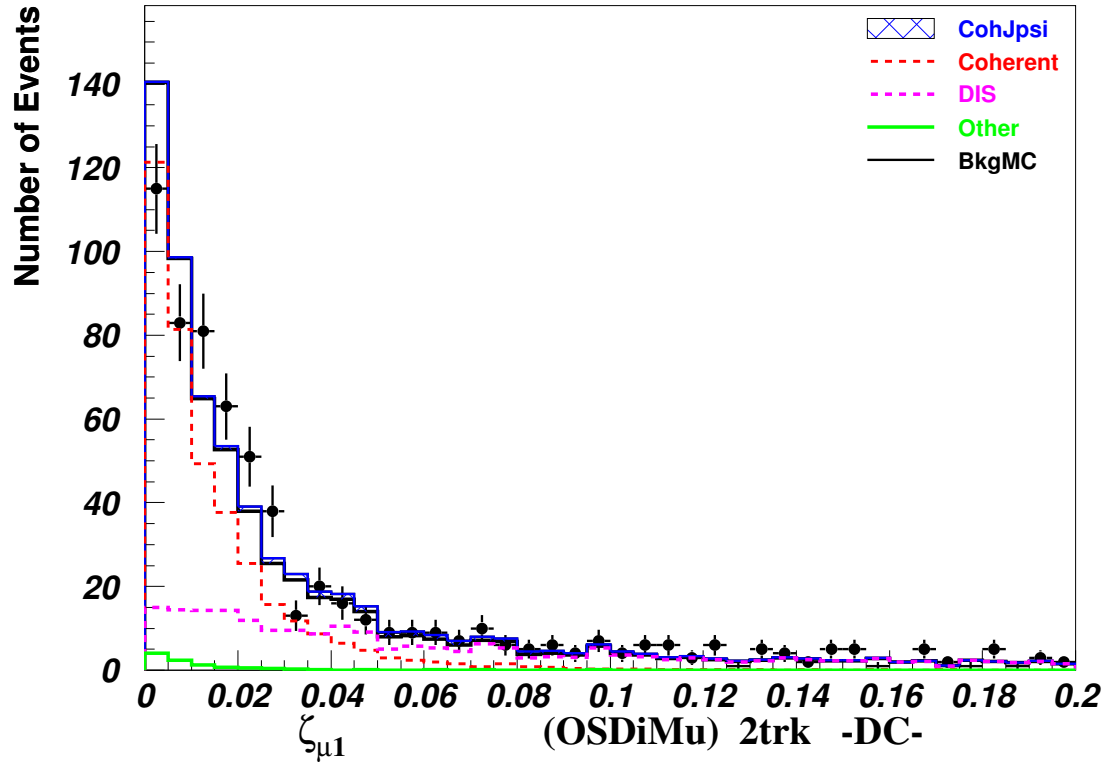


Figure 48: (./figs/zeta1+2.pdf)

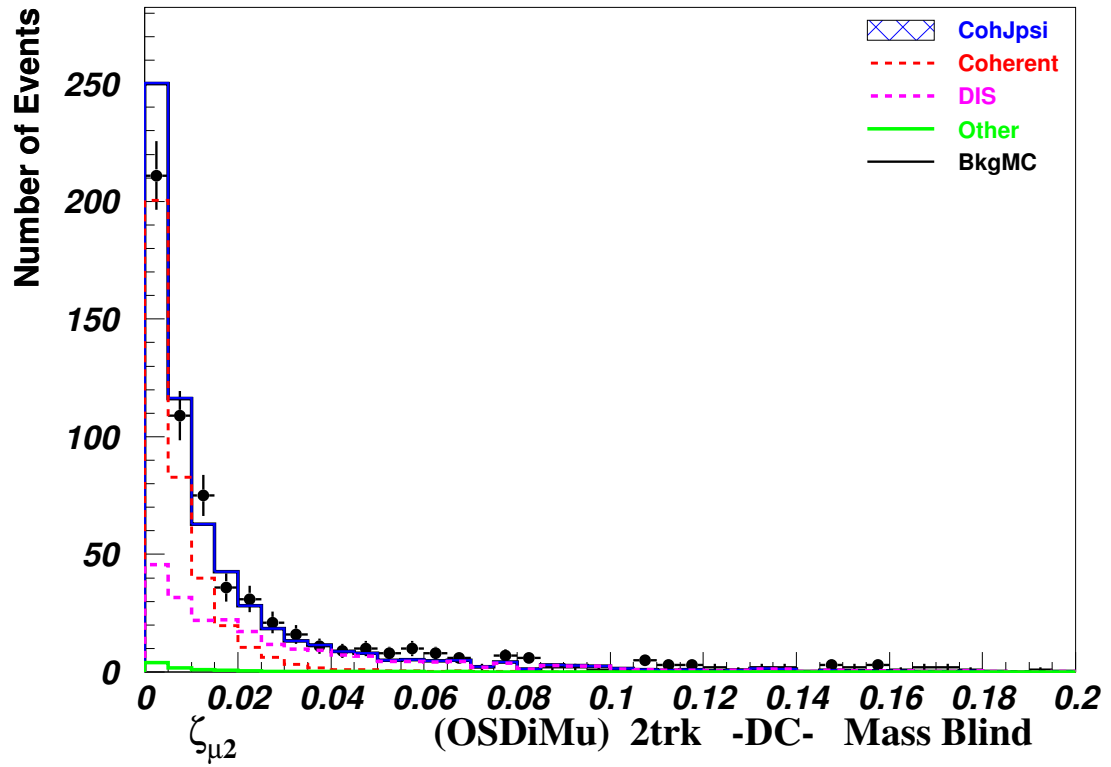
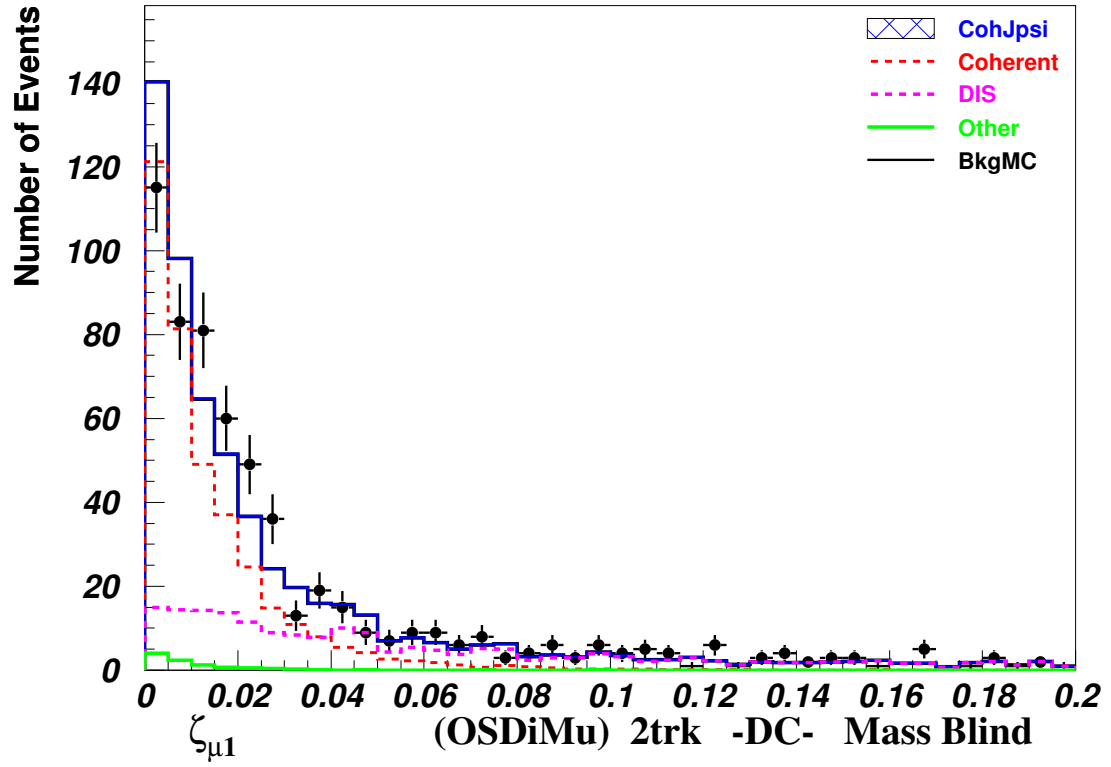


Figure 49: (./figs/zeta1+2-mb.pdf)

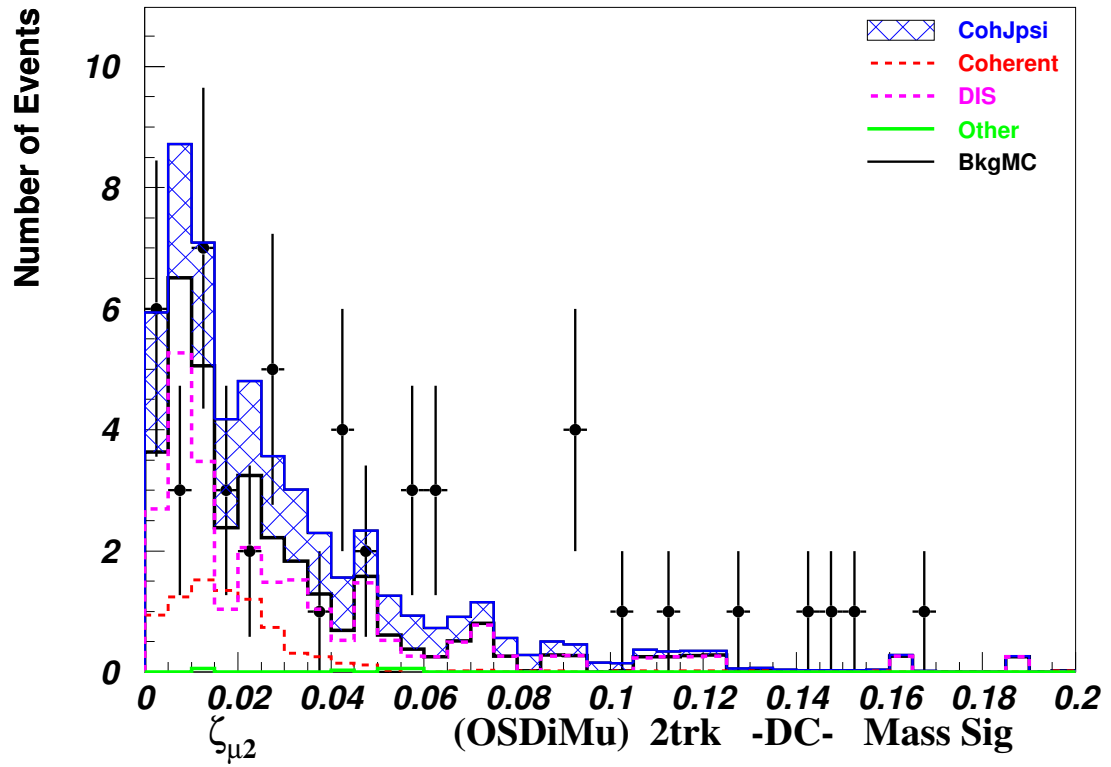
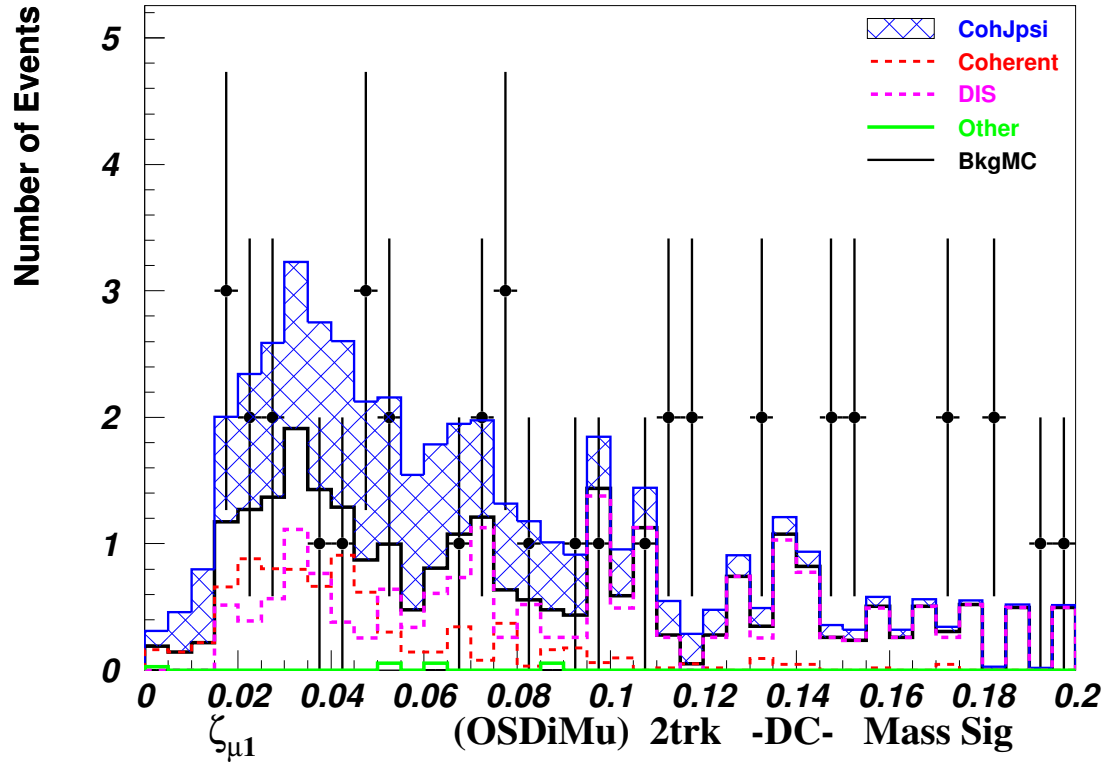


Figure 50: (./figs/zeta1+2-msig.pdf)

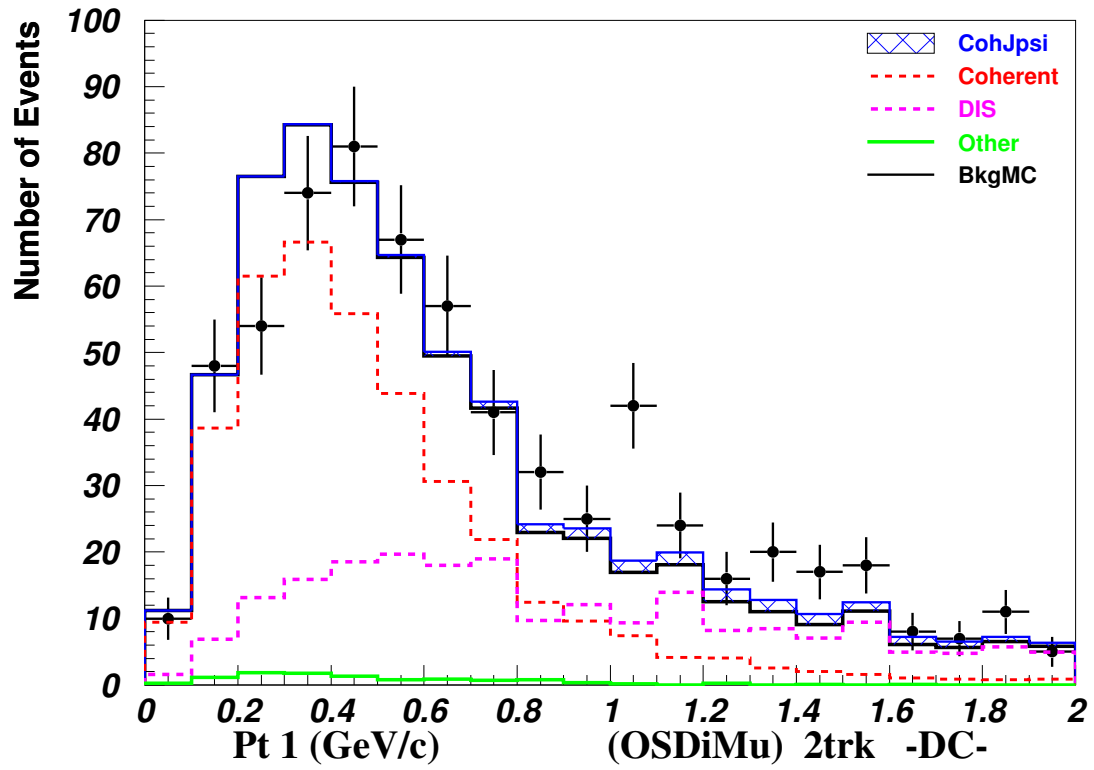
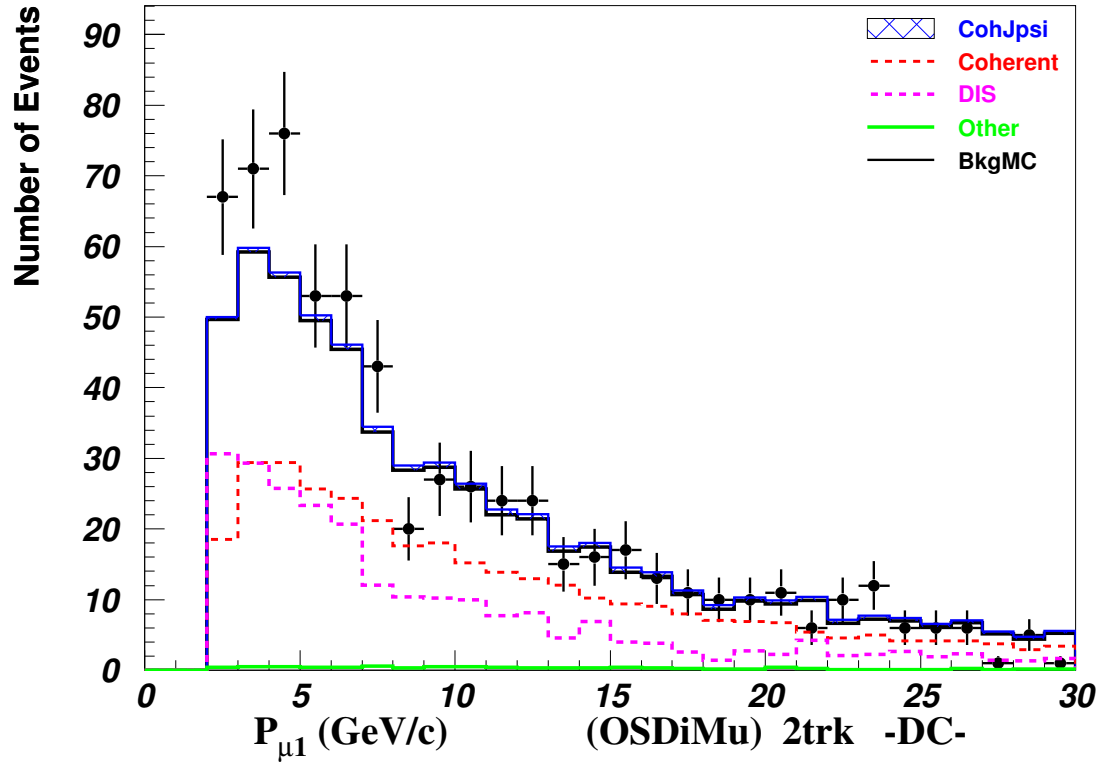


Figure 51: (./figs/p-pt-muneg.pdf)

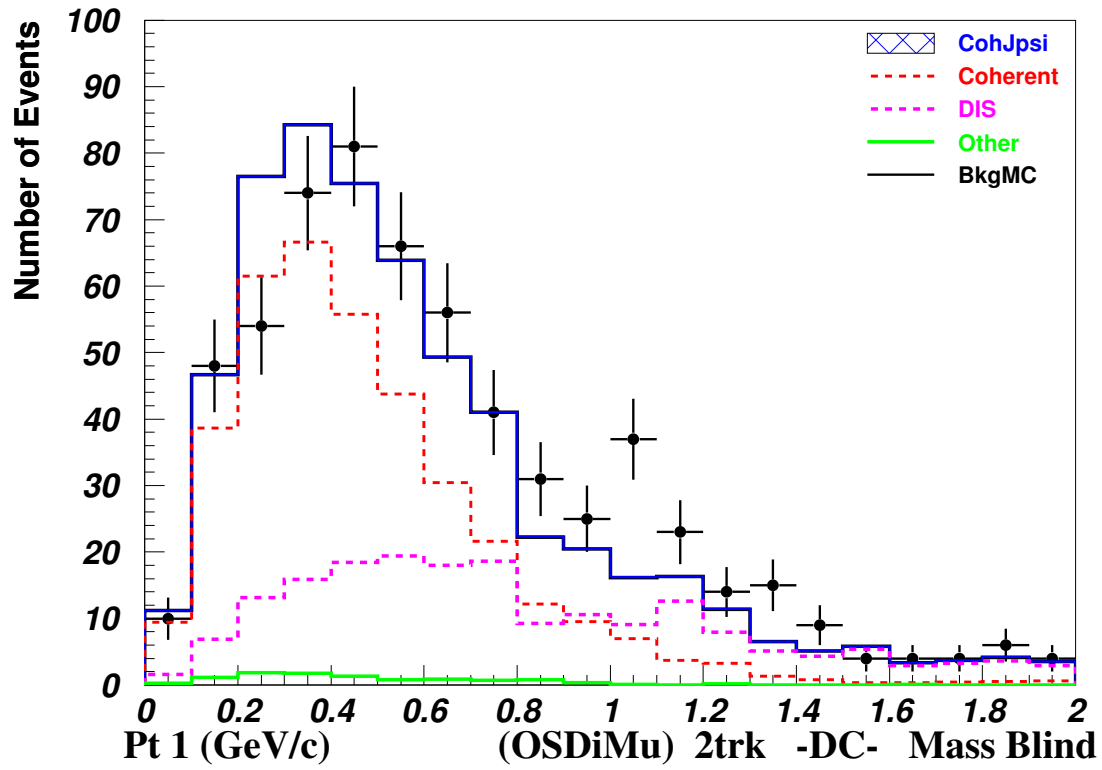
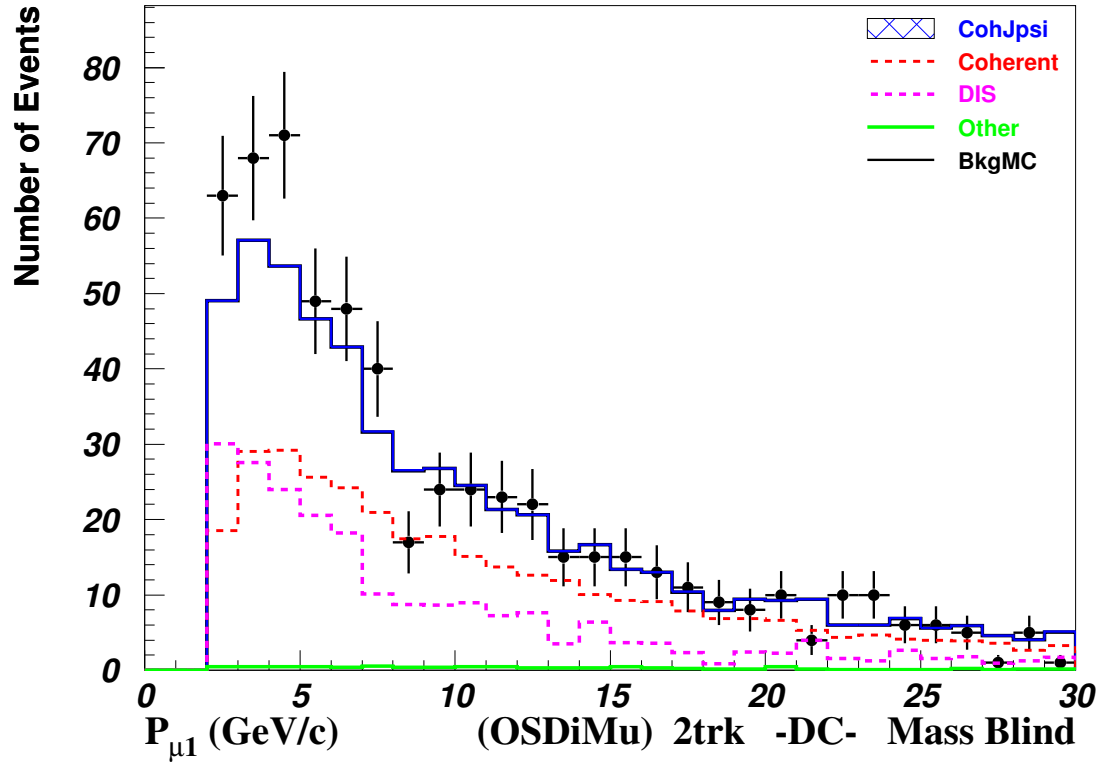


Figure 52: (./figs/p-pt-muneg-mb.pdf)

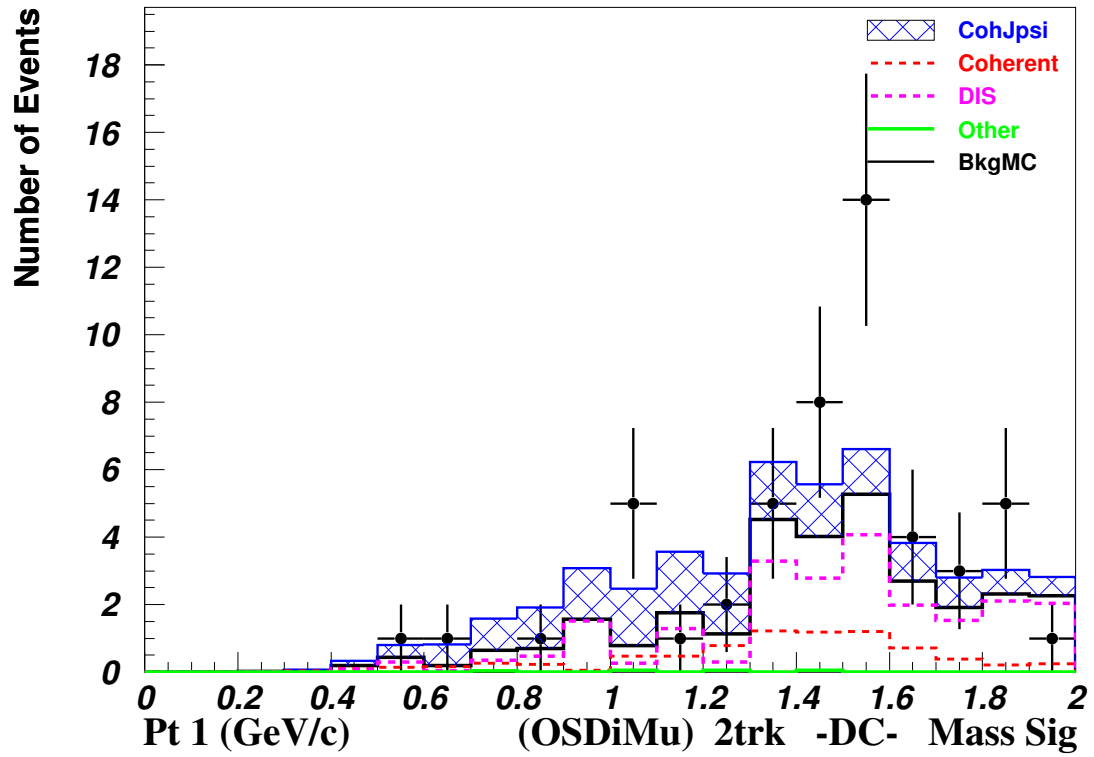
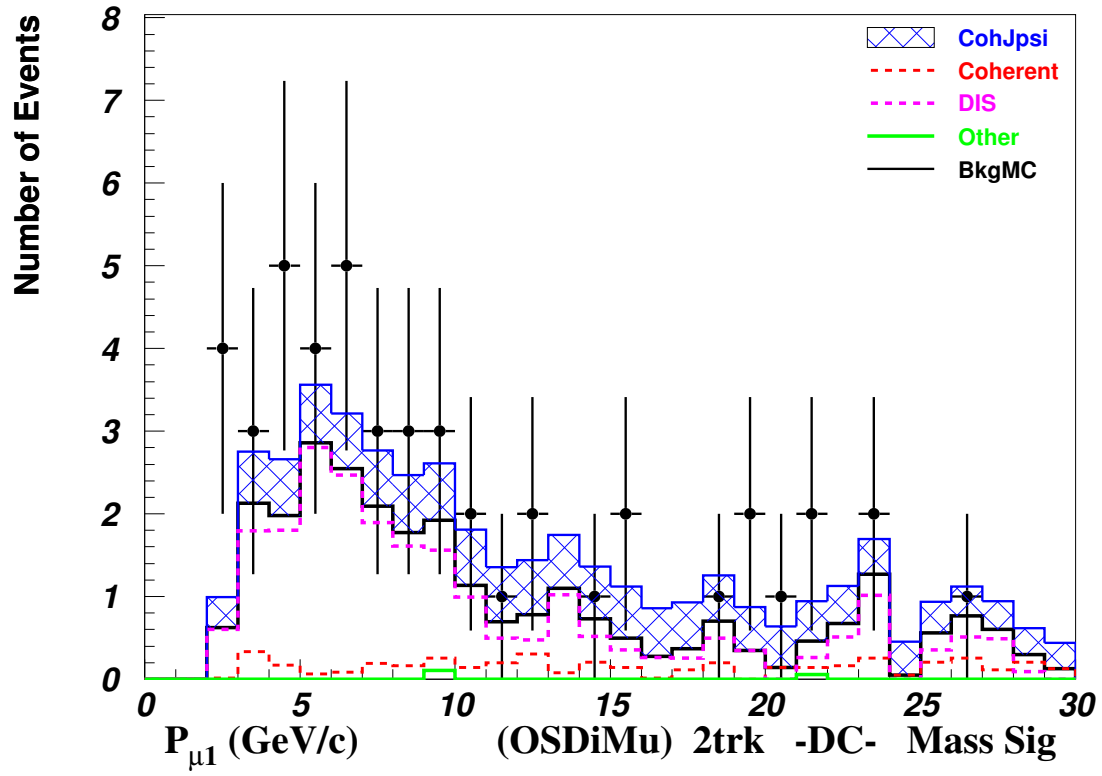


Figure 53: (./figs/p-pt-muneg-msig.pdf)

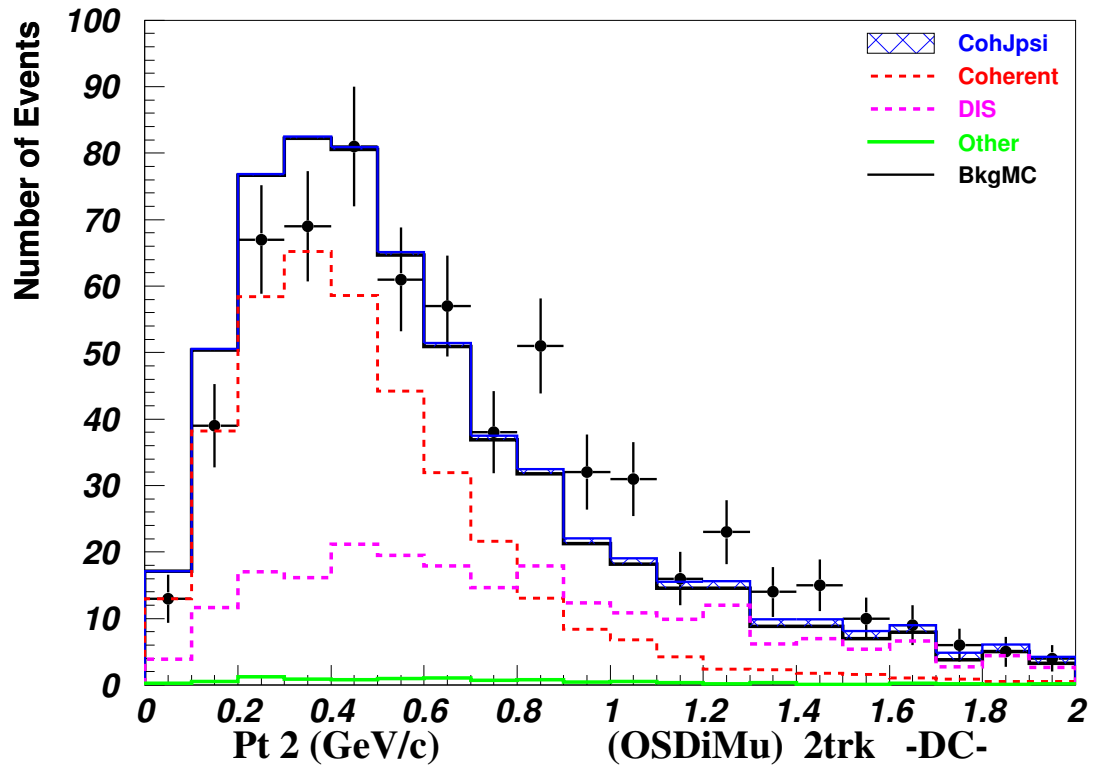
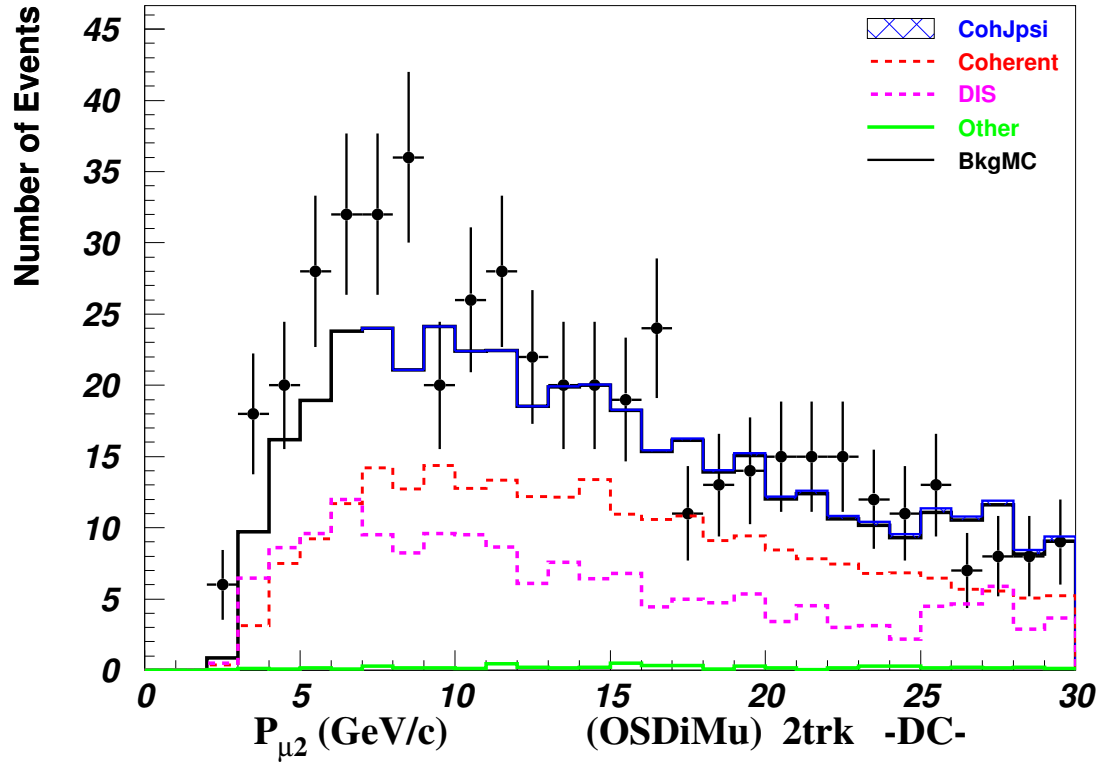


Figure 54: (./figs/p-pt-mupos.pdf)

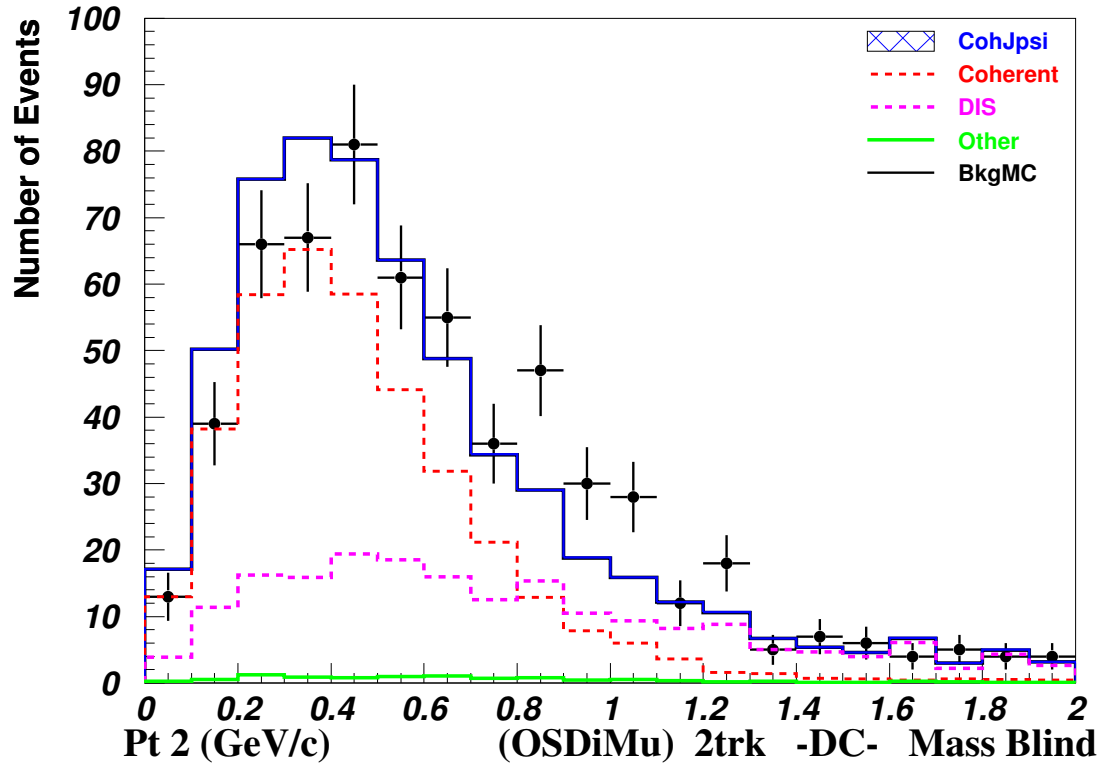
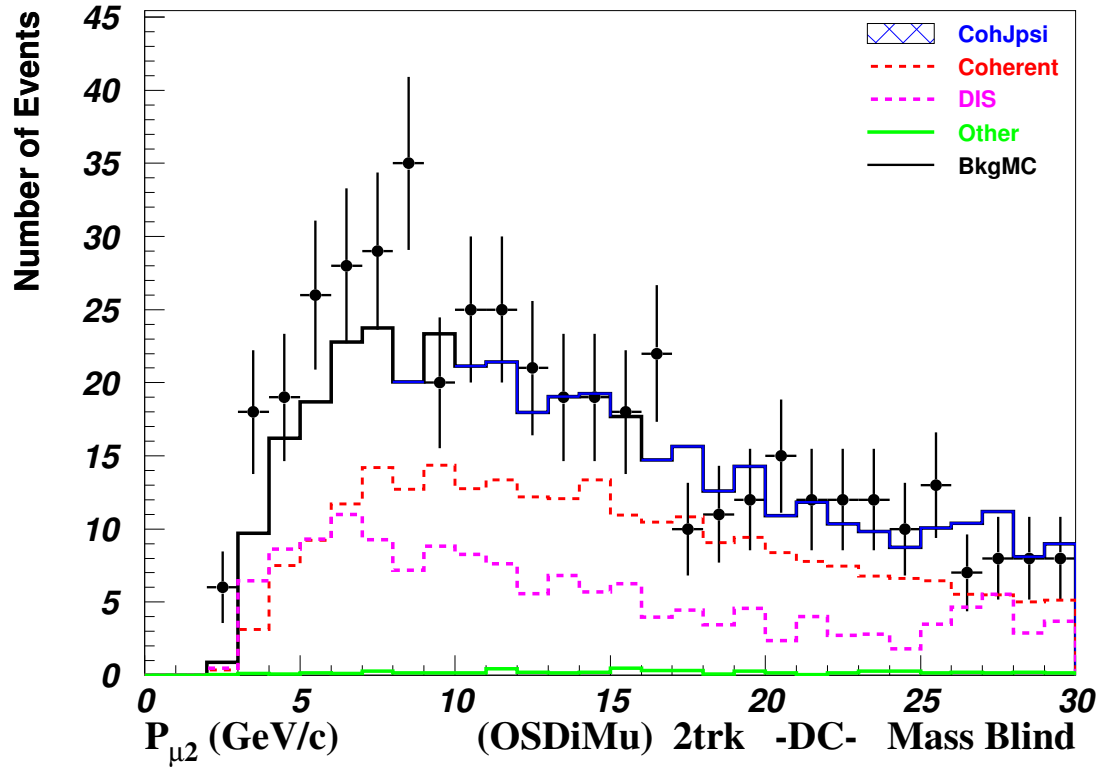


Figure 55: (./figs/p-pt-mupos-mb.pdf)

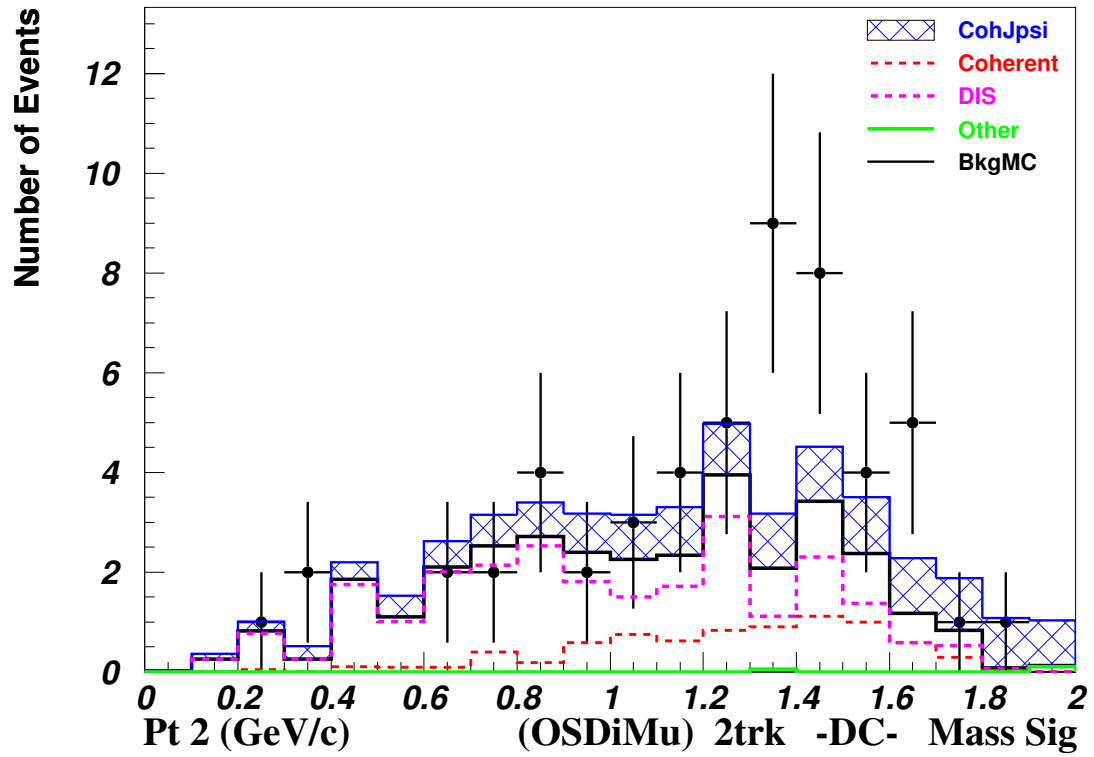
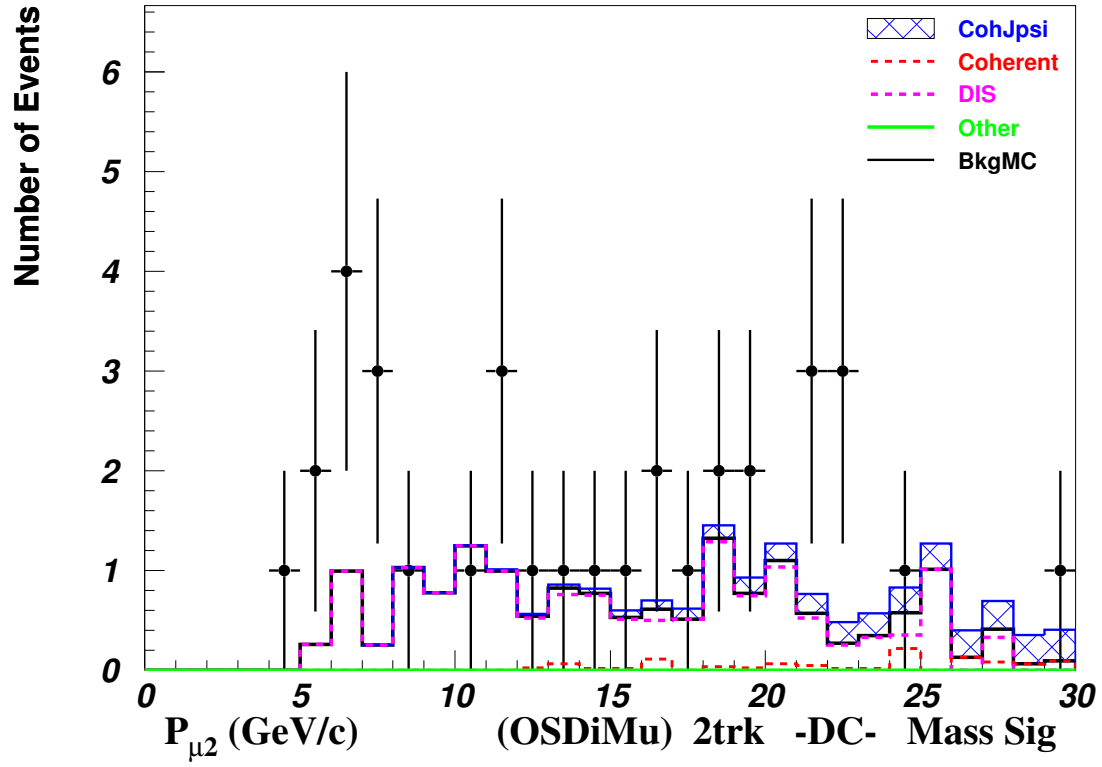


Figure 56: (./figs/p-pt-mupos-msig.pdf)

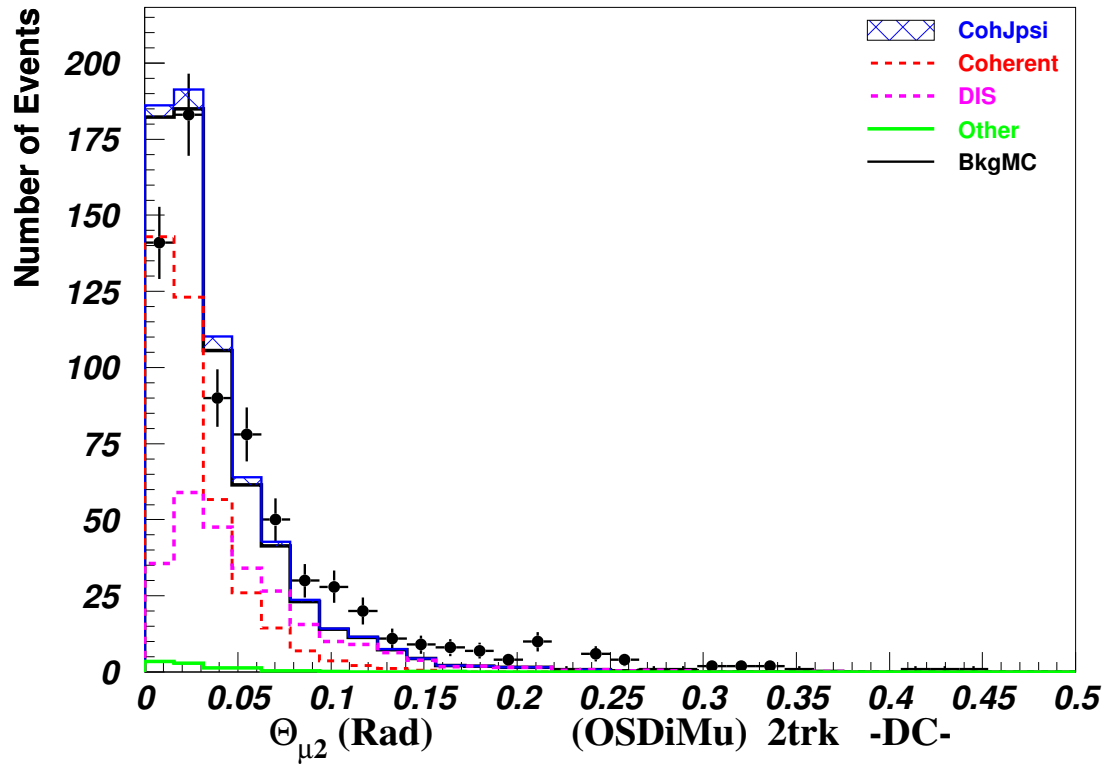
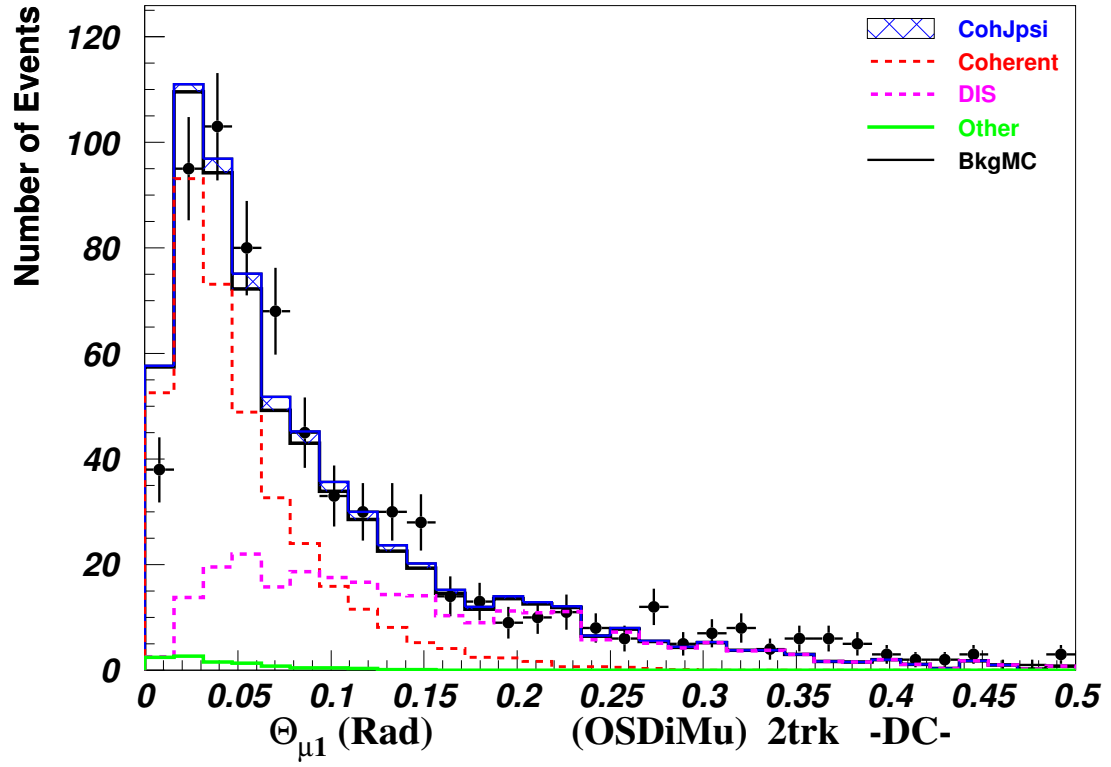


Figure 57: (./figs/theta1+2.pdf)

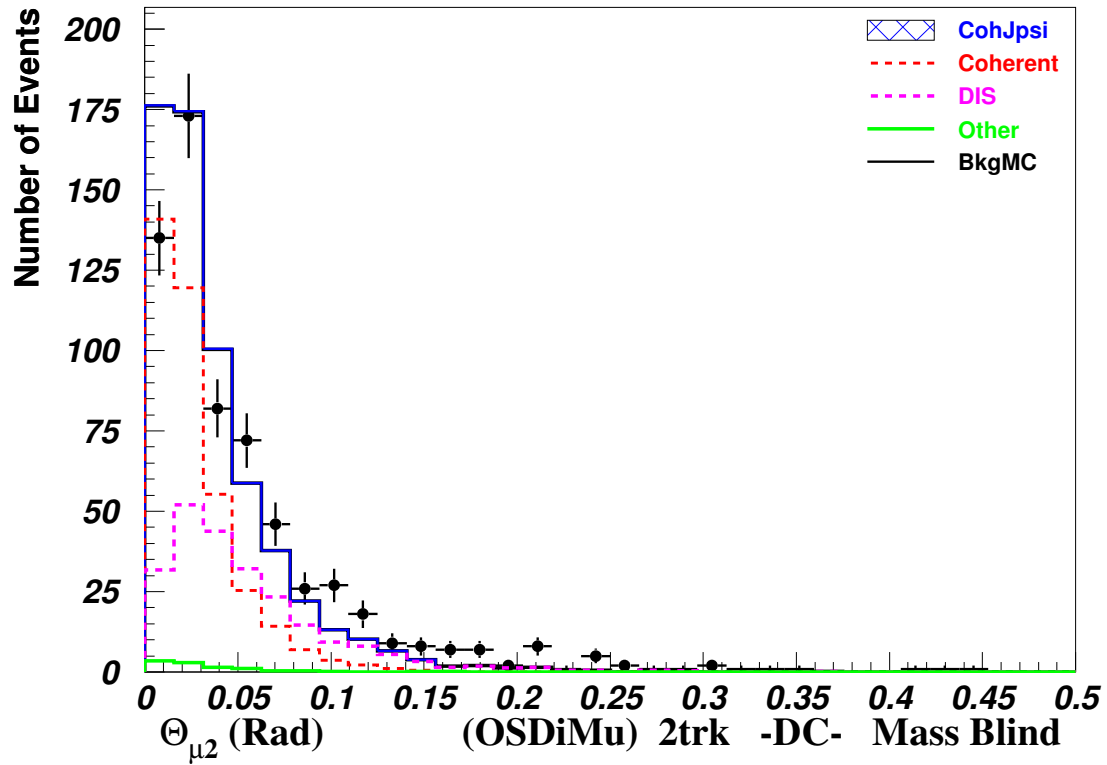
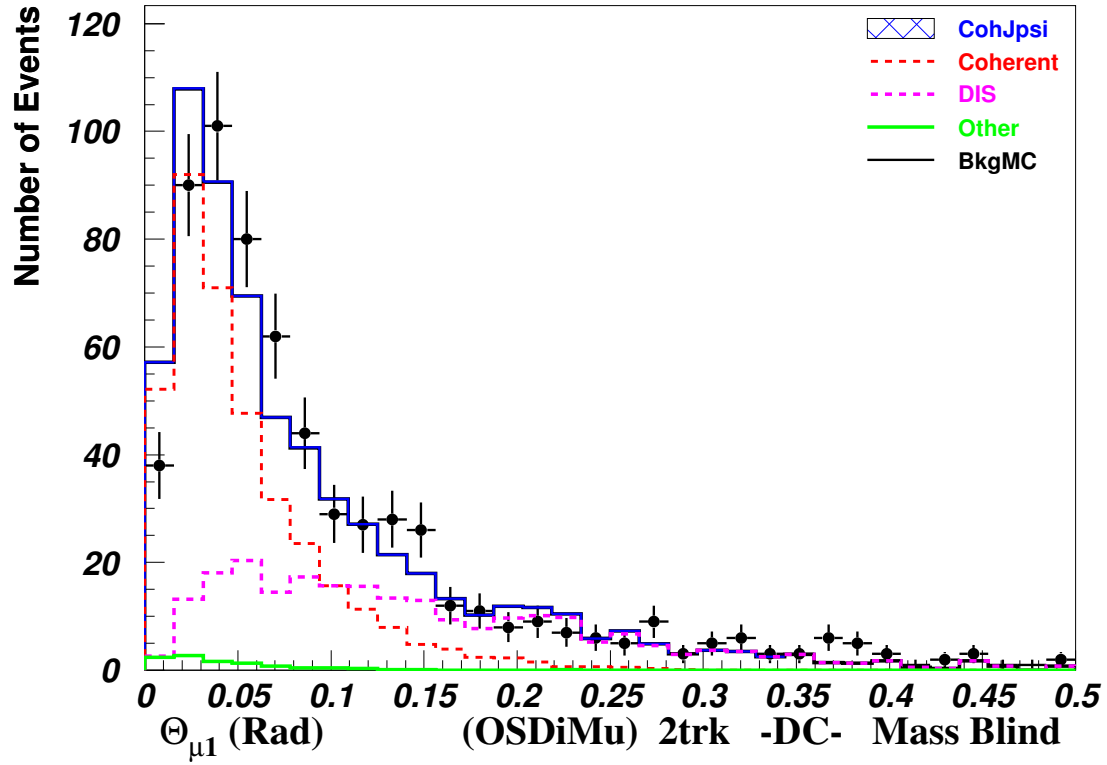


Figure 58: (./figs/theta1+2-mb.pdf)

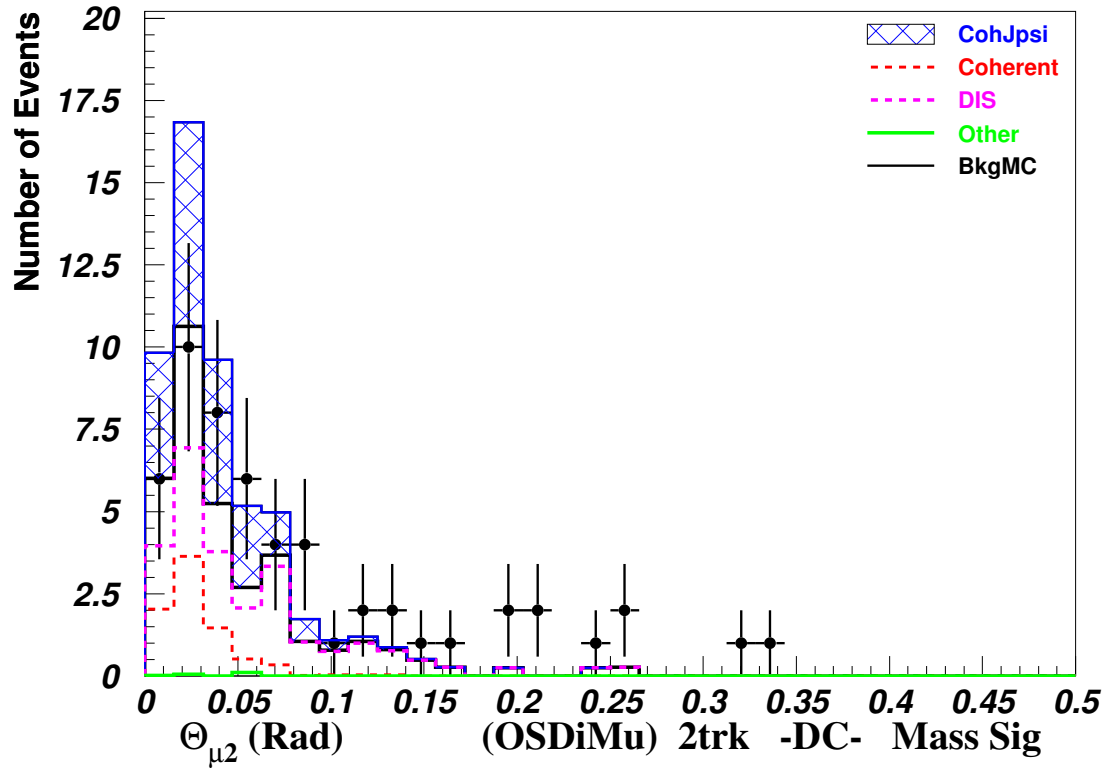
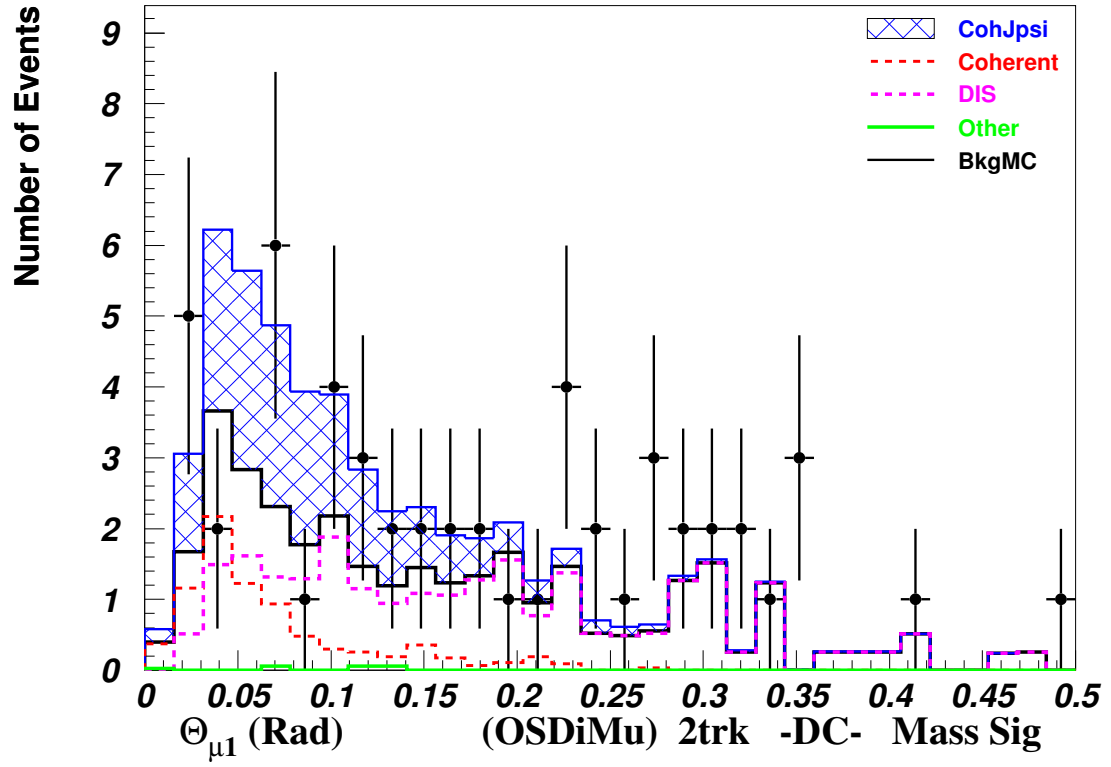


Figure 59: (./figs/theta1+2-msig.pdf)

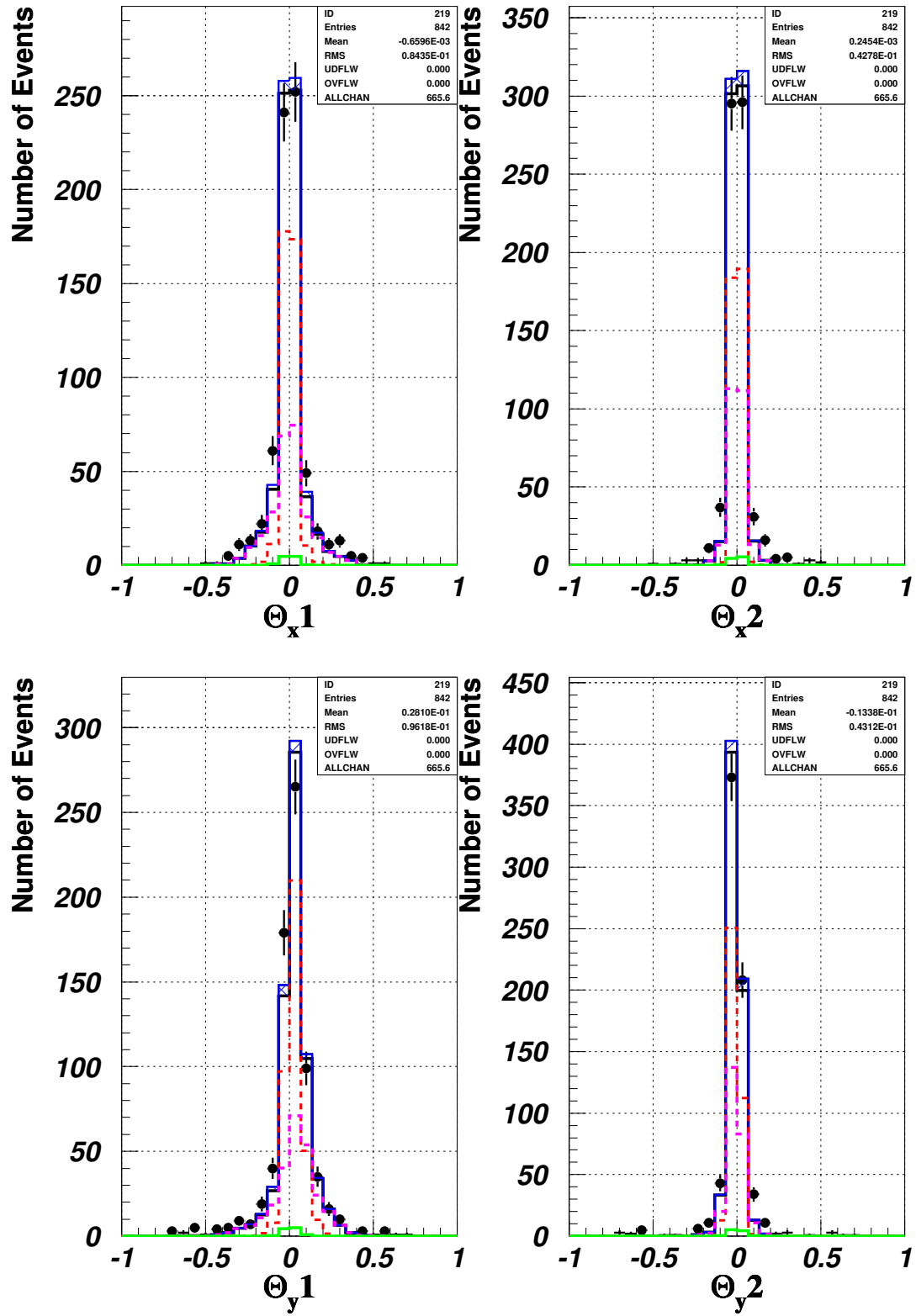


Figure 60: (./figs/thetaxy.pdf)