

Mumu Channel Update

Connor Waits 7-19-22

Sub-dominant Backgrounds

Backgrounds:

- $\mu\mu \rightarrow \mu\mu ZZ$
- $\mu\mu \rightarrow 4V$, $V = W^+, W^-$ or Z
- $\mu\mu \rightarrow ZZ$

Fully Hadronic Channel:

- 2 muons
- Dimuon mass > 106 GeV
- 2 jets with mass $50 < \text{jet_mass} < 100$ GeV

	Cross-section	Efficiency	Yield
SM10	2.975343404	0.035	10414
mumuZZ 10	0.001813875	0.041	8
4V 10	0.002399274	0.047	6
ZZ 10	0.0080156	0	0

Semi-Leptonic Channel:

- 1 muon
- 1 electron
- 1 jet with mass $50 < \text{jet_mass} < 100$ GeV

	Cross-section	Efficiency	Yield
SM10	2.9753434	0.16	48796
mumuZZ 10	0.00181388	0.026	5
4V 10	0.00239927	0.23	41
ZZ 10	0.0080156	0.02	6

Efficiency = #ofSurvivingEvents/#ofEvents

Yield = Efficiency*CS*Lumi

Grid Scan for Fully Hadronic Channel

Cuts:

- (Max) Muon momentum: [8500, 9000, 9500, 10000]
- Muon eta: [1.5, 1.75, 2, 2.25]
- (Min) Jet momentum: [500, 1000, 1500, 2000]
- Jet eta: [1.5, 1.75, 2, 2.25]

Best Limits: [-0.0032, 0.0012]

Cuts:

- (Max) Muon momentum: 9000
- Muon eta: 2.25
- (Min) Jet momentum: 1500
- Jet eta: 2

Empty bins in background histogram are automatically merged
Only 1 surviving background event, so end up with 1 bin

