

## Generating background samples using MG5

Channel	$\sigma_{unpol.}$ [fb]	
		ISR ON      ISR OFF
$\mu\mu$	2029	832
$\sum_{q=u,d,s,c} q\bar{q}$	17750	4301
$b\bar{b}$	4208	768
$\gamma Z^0$	48260	20770
$WW$	11380	10910
$Z^0 Z^0$	682	657
$Z^0 WW$	12.6	14.8
$Z^0 Z^0 Z^0$	0.63	0.73

360GeV

Channel	$\sigma_{unpol.}$ [fb]
$t\bar{t}$	572
$\mu\mu$	456
$\sum_{q=u,d,s,c} q\bar{q}$	2208
$b\bar{b}$	372
$\gamma Z^0$	11185
$WW$	6603
$Z^0 Z^0$	422
$Z^0 WW$	40
$Z^0 Z^0 Z^0$	1.1

From ILD study, 500GeV

When ISR is ON, events can't be passed to Pythia8 for showering and hadronization.

## Generating single top using MG5

```
≡ Results Summary for run: run_02 tag: tag_1 ≡  
Cross-section : 0.315 +- 0.001202 pb  
Nb of events : 10000
```

ISR ON

```
≡ Results Summary for run: run_01 tag: tag_1 ≡  
Cross-section : 0.4235 +- 0.001759 pb  
Nb of events : 10000
```

ISR OFF

When ISR is ON, events can't be passed to Pythia8 for showering and hadronization.

# Generating single top using MG5 – Feynman Diagrams

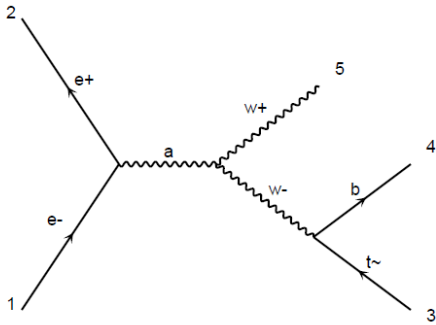


diagram 1 QCD=0, QED=3

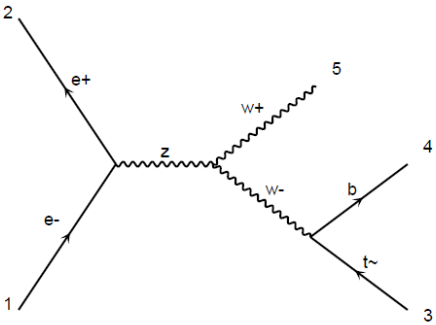


diagram 2 QCD=0, QED=3

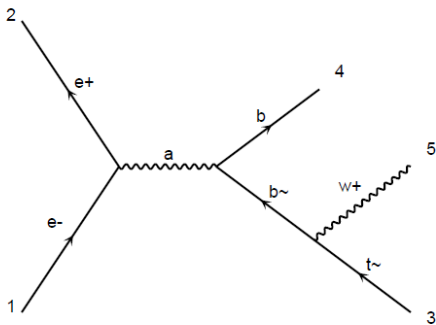


diagram 3 QCD=0, QED=3

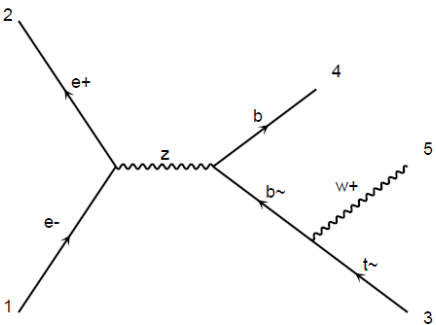


diagram 4 QCD=0, QED=3

e- e+ > t~ b w+ WEIGHTED=6

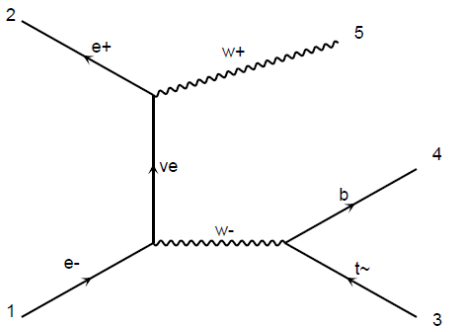


diagram 7 QCD=0, QED=3

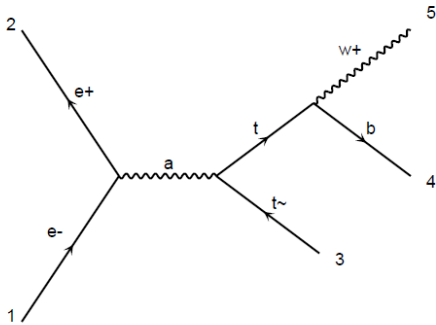


diagram 5 QCD=0, QED=3

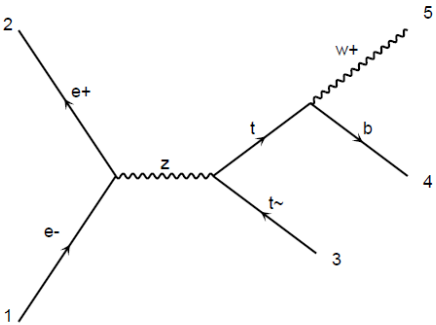


diagram 6 QCD=0, QED=3