

ILC process sample: Whizard vs Madgraph

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- 1 4f
 - ww_l

All 4-fermion back grounds

Type	ID	LL (n)	LR (n+1)	RL (n+3)	RR (n+2)	non-pol	Final states
sw_l	6585-88	40	3335	29.1	40	861	$\nu_e \nu_l (l: \mu, \tau)$
sw_sl	6563-66	119.7	10000	85.6	119.3	2581.2	$\nu_e e UD$
sze_l	6555-58	1009.6	1084.1	1019.5	1008.4	1030.4	$e \ell (l: \mu, \tau)$ $e \nu \nu_l$
sze_sl	6559-62	259.8	459.1	316.5	259.0	323.6	$ee UU, DD$
szeorsw_l	6567-70	27.7	922.1	21.6	27.6	249.8	$e \nu \nu_e$
sznu_l	6589 ^(LR) -90		192.8	39.3		58.0	$\nu_e \nu_e \ell, (l: \mu, \tau)$
sznu_sl	6571-72		456.8	130.8		146.9	$\nu_e \nu_e UU, DD$
ww_h	6551-52		14874.3	136.4		3752.7	
ww_l	6581-82		1564.2	14.7		394.7	$\nu_\mu \mu \nu \tau$
ww_sl	6577-78		18781.0	172.7		4738.4	$UD \nu_l (l: \mu, \tau)$
zz_h	6573-74		1402.1	605.0		501.8	
zz_l	6579-80		158.0	99.5		64.4	$2l2l (l: \mu, \tau)$ $2l'2\nu_l$
zz_sl	6575-76		1422.1	713.5		533.9	
zzorww_h	6553-54		12383.3	224.8		3152.0	
zzorww_l	6721-22		1636.0	54.0		422.5	$2l2\nu_l (l: \mu, \tau)$

- 4f_WW_leotonic: $e^- e^+ \rightarrow W^- W^+ \rightarrow \nu_\mu \mu \nu_\tau \tau$
- ID: 6581-82, $\sqrt{s} = 250$ GeV.

Table: cross section(fb) with polarizations

ww_1	LL	LR	RL	RR	non-pol
Whizard+pythia		1564.2	14.7		394.7
Madgraph+pythia	0	1476	13.1	0	372.3

Matrix for $e^- e^+ \rightarrow \bar{\nu}_\mu \mu^- \nu_\tau \tau^+$.

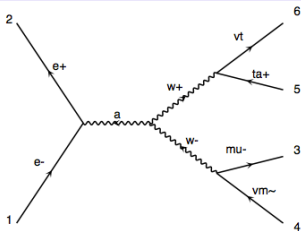


diagram 1

QCD=0, QED=4

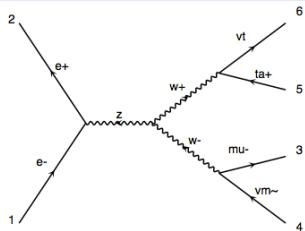


diagram 2

QCD=0, QED=4

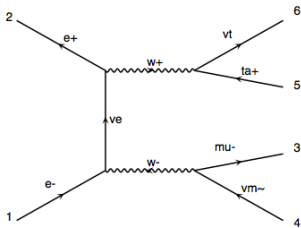


diagram 3

QCD=0, QED=4

Matrix for $e^- e^+ \rightarrow \nu_\mu \mu^+ \bar{\nu}_\tau \tau^-$.

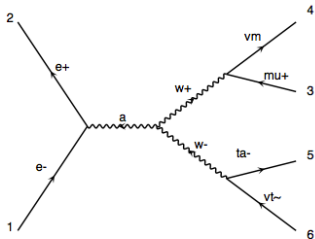


diagram 1 QCD=0, QED=4

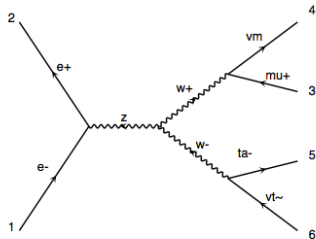


diagram 2 QCD=0, QED=4

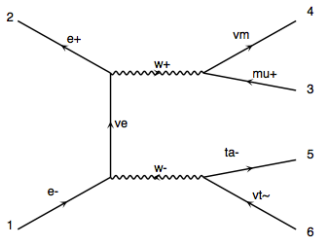


diagram 3 QCD=0, QED=4