

Legend, Assumptions:

- l : e/μ
- L : $e/\mu/\tau$
- j_l : light jet
- b : bottom jet
- t : top jet
- j_3 : b/t
- J : j_l/j_3
- SU (2) doublet sparticles are (nearly) mass degenerate.
- Whenever two signals are equally likely, we only write the one with more leptons.
- Whenever two signals with the same number of leptons are equally likely, we only write the one with more leptons from the first two generations.
- Sometimes we state more than one signature for a given transition because one signature might be preferable in the above sense (it has more leptons) but the other one might be more probable (for instance it has a higher cross-section, or may be the only kinematically accessible one, etc.).
- We take into account the possibility that the sleptons, electroweakinos and third generation squarks might be light enough that their decay into a top quark might be kinematically disfavoured. But we do not do this for the gluino/first two generation squarks.
- The tables contain the **minimal set** of objects that should always appear in pair production of the LSP followed by its decay. There can always be more objects.

2 Signatures

2.1 LLE

LSP	LLE (I)	LL ₃ E (II)	LLE ₃ (III)	LL ₃ E ₃ (IV)
$\tilde{l}(\tilde{\nu})$	$(3l + E_T^{\text{miss}})/4L$	$(2l + 1\tau + E_T^{\text{miss}})/(2l + 2\tau)$	$(1l + 2\tau + E_T^{\text{miss}})/(2l + 2\tau)$	$(3\tau + E_T^{\text{miss}})/4L$
\tilde{e}	$(2l + E_T^{\text{miss}})$	$(2l + E_T^{\text{miss}})/(1l + 1\tau + E_T^{\text{miss}})$	$4l + 2\tau + E_T^{\text{miss}}$	$(4l + 2\tau + E_T^{\text{miss}})/(3l + 3\tau + E_T^{\text{miss}})$
$\tilde{\tau}(\tilde{\nu}_\tau)$	$(4l + 2\tau + E_T^{\text{miss}})/(4l + 1\tau + E_T^{\text{miss}})$	$(3l + E_T^{\text{miss}})/4L$	$(2l + 4\tau + E_T^{\text{miss}})/(2l + 3\tau + E_T^{\text{miss}})$	$(2l + 2\tau)/(1l + 2\tau + E_T^{\text{miss}})$
$\tilde{\tau}_R$	$4l + 2\tau + E_T^{\text{miss}}$	$(4l + 2\tau + E_T^{\text{miss}})/(3l + 3\tau + E_T^{\text{miss}})$	$2l + E_T^{\text{miss}}$	$(2l + E_T^{\text{miss}})/(1l + 1\tau + E_T^{\text{miss}})$
\tilde{g}	$4l + 4J + E_T^{\text{miss}}$	$(4l + 4J + E_T^{\text{miss}})/(3l + 1\tau + 4J + E_T^{\text{miss}})$	$2l + 2\tau + 4J + E_T^{\text{miss}}$	$(2l + 2\tau + 4J + E_T^{\text{miss}})/(1l + 3\tau + 4J + E_T^{\text{miss}})$
$\tilde{q}/\tilde{u}/\tilde{d}$	$4l + 2j_i + E_T^{\text{miss}}$	$(4l + 2j_i + E_T^{\text{miss}})/(3l + 1\tau + 2j_i + E_T^{\text{miss}})$	$2l + 2\tau + 2j_i + E_T^{\text{miss}}$	$(2l + 2\tau + 2j_i + E_T^{\text{miss}})/(1l + 3\tau + 2j_i + E_T^{\text{miss}})$
$\tilde{t}_L(\tilde{b}_L)/\tilde{t}_R$	$(4l + 2j_s + E_T^{\text{miss}})$	$(4l + 2j_s + E_T^{\text{miss}})/(3l + 1\tau + 2j_s + E_T^{\text{miss}})$	$(2l + 2\tau + 2j_s + E_T^{\text{miss}})$	$(2l + 2\tau + 2j_s + E_T^{\text{miss}})/(1l + 3\tau + 2j_s + E_T^{\text{miss}})$
\tilde{b}_R	$(4l + 2b + E_T^{\text{miss}})$	$(4l + 2b + E_T^{\text{miss}})/(3l + 1\tau + 2b + E_T^{\text{miss}})$	$2l + 2\tau + 2b + E_T^{\text{miss}}$	$(2l + 2\tau + 2b + E_T^{\text{miss}})/(1l + 3\tau + 2b + E_T^{\text{miss}})$
$\tilde{B}/\tilde{W}/\tilde{H}$	$4l + E_T^{\text{miss}}$	$(4l + E_T^{\text{miss}})/(3l + 1\tau + E_T^{\text{miss}})$	$2l + 2\tau + E_T^{\text{miss}}$	$(2l + 2\tau + E_T^{\text{miss}})/(1l + 3\tau + E_T^{\text{miss}})$

1. Four leptons 1: $4L + E_T^{\text{miss}}$ (- or + 2J or +4J)
2. Four leptons 2: $4L$
3. Two leptons: $2L + E_T^{\text{miss}}$
4. Three leptons: $3L + E_T^{\text{miss}}$
5. Five leptons: $5L + E_T^{\text{miss}}$
6. Six leptons: $6L + E_T^{\text{miss}}$

2.2 UDD

LSP	UDD (I)	UD ₃ D (II)	U ₃ DD (III)	U ₃ D ₃ D (IV)
$\tilde{l}(\tilde{\nu})$	$(2l + 6j_l) / (1l + 6j_l + E_T^{\text{miss}})$	$(2l + 2b + 4j_l) / (1l + 2b + 4j_l + E_T^{\text{miss}})$	$(2l + 2j_3 + 4j_l) / (1l + 2j_3 + 4j_l + E_T^{\text{miss}})$	$(2l + 2j_3 + 2b + 2j_l) / (1l + 2j_3 + 2b + 2j_l + E_T^{\text{miss}})$
\tilde{e}	$(2l + 6j_l)$	$(2l + 2b + 4j_l)$	$(2l + 2j_3 + 4j_l)$	$(2l + 2j_3 + 2b + 2j_l)$
$\tilde{\tau}(\tilde{\nu}_\tau)$	$(2\tau + 6j_l) / (1\tau + 6j_l + E_T^{\text{miss}})$	$(2\tau + 2b + 4j_l) / (1\tau + 2b + 4j_l + E_T^{\text{miss}})$	$(2\tau + 2j_3 + 4j_l) / (1\tau + 2j_3 + 4j_l + E_T^{\text{miss}})$	$(2\tau + 2j_3 + 2b + 2j_l) / (1\tau + 2j_3 + 2b + 2j_l + E_T^{\text{miss}})$
$\tilde{\tau}_R$	$(2\tau + 6j_l)$	$(2\tau + 2b + 4j_l)$	$(2\tau + 2j_3 + 4j_l)$	$(2\tau + 2j_3 + 2b + 2j_l)$
\tilde{g}	$8j_l$	$2b + 4j_l$	$2t + 4j_l$	$2t + 2b + 2j_l$
\tilde{q}	$8j_l$	$2b + 6j_l$	$2t + 6j_l$	$2t + 2b + 4j_l$
\tilde{u}	$4j_l$	$2b + 2j_l$	$2t + 6j_l$	$2t + 2b + 4j_l$
\tilde{d}	$4j_l$	$2b + 2j_l$	$2t + 2j_l$	$2t + 2b$
$\tilde{t}_L(\tilde{b}_L)$	$2j_3 + 6j_l$	$2j_3 + 2b + 4j_l$	$4j_3 + 4j_l$	$4j_3 + 2b + 2j_l$
\tilde{t}_R	$2j_3 + 6j_l$	$2j_3 + 2b + 4j_l$	$4j_l$	$2b + 2j_l$
\tilde{b}_R	$2b + 6j_l$	$4j_l$	$2j_3 + 2b + 4j_l$	$2j_3 + 2j_l$
$\tilde{B}/\tilde{W}/\tilde{H}$	$8j_l$	$2b + 4j_l$	$2j_3 + 4j_l$	$2j_3 + 2b + 2j_l$

1. Two lepton: $2L + 6J$
2. One lepton: $1L + 6J + E_T^{\text{miss}}$
3. Zero lepton 1: $8J$
4. Zero lepton 2: $6J$
5. Zero lepton 3: $4J$

2.3 LQD

LSP	LQD (I)	LQD ₃ (II)	LQ ₃ D (III)	LQ ₃ D ₃ (IV)
$\tilde{l}(\tilde{\nu})$	$4j_i$	$2b + 2j_i$	$(2i_3 + 2j_i)$	$(2b + 2j_3)$
\tilde{e}	$(3l + 4j_i) / (3l + 4j_i + E_T^{\text{miss}})$	$(3l + 2j_i + 2b) / (3l + 2j_i + 2b + E_T^{\text{miss}})$	$(4l + 2j_i + 2\tau) / (3l + 2j_i + \tau + b + E_T^{\text{miss}})$	$(4l + 2\tau + 2b) / (3l + \tau + 3b + E_T^{\text{miss}})$
$\tilde{\tau}(\tilde{\nu}_\tau)$	$(2l + 2\tau + 4j_i) / (2l + 1\tau + 4j_i + E_T^{\text{miss}})$	$(2l + 2\tau + 2j_i + 2b) / (2l + 1\tau + 2j_i + 2b + E_T^{\text{miss}})$	$(2l + 2\tau + 2l + 2j_i) / (2l + 1\tau + 2l + 2j_i + E_T^{\text{miss}})$	$(2l + 2\tau + 2l + 2b) / (2l + 1\tau + 2l + 2b + E_T^{\text{miss}})$
$\tilde{\tau}_R$	$(2l + 2\tau + 4j_i) / (1l + 2\tau + 4j_i + E_T^{\text{miss}})$	$(2l + 2\tau + 2j_i + 2b) / (1l + 2\tau + 2j_i + 2b + E_T^{\text{miss}})$	$(2l + 2\tau + 2j_i + 2\tau) / (1l + 2\tau + 2j_i + \tau + b + E_T^{\text{miss}})$	$(2l + 2\tau + 2l + 2b) / (1l + 2\tau + \tau + 3b + E_T^{\text{miss}})$
\tilde{g}	$(2l + 4j_i) / (l + E_T^{\text{miss}} + 4j_i)$	$(2l + 2j_i + 2b) / (l + E_T^{\text{miss}} + 2j_i + 2b)$	$(2l + 2j_i + 2\tau) / (l + E_T^{\text{miss}} + 2j_i + \tau + b)$	$(2l + 2b + 2\tau) / (l + E_T^{\text{miss}} + 3b + \tau)$
\tilde{q}	$(2l + 2j_i) / (l + E_T^{\text{miss}} + 2j_i)$	$(2l + 2b) / (l + E_T^{\text{miss}} + 2b)$	$(2l + 4j_i + 2\tau) / (l + E_T^{\text{miss}} + 4j_i + \tau + b)$	$(2l + 2j_i + 2b + 2\tau) / (l + E_T^{\text{miss}} + 2j_i + 3b + \tau)$
\tilde{u}	$(2l + 6j_i) / (l + E_T^{\text{miss}} + 6j_i)$	$(2l + 4j_i + 2b) / (l + E_T^{\text{miss}} + 4j_i + 2b)$	$(2l + 4j_i + 2\tau) / (l + E_T^{\text{miss}} + 4j_i + \tau + b)$	$(2l + 2j_i + 2b + 2\tau) / (l + E_T^{\text{miss}} + 2j_i + 3b + \tau)$
\tilde{d}	$(2l + 2j_i) / (l + E_T^{\text{miss}} + 2j_i)$	$(2l + 4j_i + 2b) / (l + E_T^{\text{miss}} + 4j_i + 2b)$	$(2l + 2\tau) / (l + E_T^{\text{miss}} + \tau + b)$	$(2l + 2j_i + 2b + 2\tau) / (l + E_T^{\text{miss}} + 2j_i + 3b + \tau)$
$\tilde{t}_L(\tilde{b}_L)$	$(2l + 2j_3 + 4j_i) / (l + E_T^{\text{miss}} + 2j_3 + 4j_i)$	$(2l + 2j_3 + 2b + 2j_i) / (l + E_T^{\text{miss}} + 2j_3 + 2b + 2j_i)$	$(2l + 2j_i) / (l + E_T^{\text{miss}} + 2j_i + 2j_3 + b)$	$(2l + 2b) / (l + E_T^{\text{miss}} + 2j_3 + 3b + \tau)$
\tilde{t}_R	$(2l + 4j_i + 2j_3) / (l + E_T^{\text{miss}} + 4j_i + 2j_3)$	$(2l + 2j_i + 4j_i + 2b) / (l + E_T^{\text{miss}} + 2j_i + 2j_3 + 2b)$	$(2l + 2j_i + 2l + 2b) / (l + E_T^{\text{miss}} + 2j_i + \tau + 3b)$	$(2l + 2j_3 + 2b + 2\tau) / (l + E_T^{\text{miss}} + 2j_3 + 3b + \tau)$
\tilde{b}_R	$(2l + 2b + 4j_i) / (l + E_T^{\text{miss}} + 2b + 4j_i)$	$(2l + 2j_i) / (l + E_T^{\text{miss}} + 2j_i)$	$(2l + 2j_i + 2l + 2b) / (l + E_T^{\text{miss}} + 2j_i + \tau + 3b)$	$(2l + 2\tau) / (l + E_T^{\text{miss}} + b)$
$\tilde{B}/\tilde{W}/\tilde{H}$	$(2l + 4j_i) / (l + E_T^{\text{miss}} + 4j_i)$	$(2l + 2j_i + 2b) / (l + E_T^{\text{miss}} + 2j_i + 2b)$	$(2l + 2\tau + 2j_i) / (l + E_T^{\text{miss}} + \tau + b + 2j_i)$	$(2l + 2\tau + 2b) / (l + E_T^{\text{miss}} + \tau + 3b)$

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LSP	L ₃ QD (V)	L ₃ QD ₃ (VI)	L ₃ Q ₃ D (VII)	L ₃ Q ₃ D ₃ (VIII)
$\tilde{l}(\tilde{\nu})$	$4j_i$	$2b + 2j_i$	$(2i_3 + 2j_i)$	$(2b + 2j_3)$
\tilde{e}	$(2l + 2\tau + 4j_i) / (1l + 2\tau + 4j_i + E_T^{\text{miss}})$	$(2l + 2\tau + 2j_i + 2b) / (1l + 2\tau + 2j_i + 2b + E_T^{\text{miss}})$	$(2l + 2\tau + 2l + 2j_i) / (1l + 2\tau + 2l + 2j_i + E_T^{\text{miss}})$	$(2l + 2\tau + 2l + 2b) / (1l + 2\tau + 2l + 2b + E_T^{\text{miss}})$
$\tilde{\tau}(\tilde{\nu}_\tau)$	$(2l + 2\tau + 4j_i) / (2l + 1\tau + 4j_i + E_T^{\text{miss}})$	$(2l + 2\tau + 2j_i + 2b) / (2l + 1\tau + 2j_i + 2b + E_T^{\text{miss}})$	$(2l + 2\tau + 2j_i + 2\tau) / (2l + 1\tau + 2j_i + \tau + b + E_T^{\text{miss}})$	$(2l + 2\tau + 2l + 2b) / (2l + 1\tau + \tau + 3b + E_T^{\text{miss}})$
$\tilde{\tau}_R$	$(4\tau + 4j_i) / (3\tau + 4j_i + E_T^{\text{miss}})$	$(4\tau + 2j_i + 2b) / (3\tau + 2j_i + 2b + E_T^{\text{miss}})$	$(4\tau + 2j_i + 2\tau) / (3\tau + 2j_i + \tau + b + E_T^{\text{miss}})$	$(4\tau + 2\tau + 2b) / (3\tau + \tau + 3b + E_T^{\text{miss}})$
\tilde{g}	$(2l + 4j_i) / (l + E_T^{\text{miss}} + 4j_i)$	$(2l + 2j_i + 2b) / (l + E_T^{\text{miss}} + 2j_i + 2b)$	$(2l + 2j_i + 2\tau) / (l + E_T^{\text{miss}} + 2j_i + \tau + b)$	$(2l + 2b + 2\tau) / (l + E_T^{\text{miss}} + 3b + \tau)$
\tilde{q}	$(2\tau + 2j_i) / (\tau + E_T^{\text{miss}} + 2j_i)$	$(2\tau + 2b) / (\tau + E_T^{\text{miss}} + 2b)$	$(2\tau + 4j_i + 2\tau) / (\tau + E_T^{\text{miss}} + 4j_i + \tau + b)$	$(2\tau + 2j_i + 2b + 2\tau) / (\tau + E_T^{\text{miss}} + 2j_i + 3b + \tau)$
\tilde{u}	$(2\tau + 6j_i) / (\tau + E_T^{\text{miss}} + 6j_i)$	$(2\tau + 4j_i + 2b) / (\tau + E_T^{\text{miss}} + 4j_i + 2b)$	$(2\tau + 4j_i + 2\tau) / (\tau + E_T^{\text{miss}} + 4j_i + \tau + b)$	$(2\tau + 2j_i + 2b + 2\tau) / (\tau + E_T^{\text{miss}} + 2j_i + 3b + \tau)$
\tilde{d}	$(2\tau + 2j_i) / (\tau + E_T^{\text{miss}} + 2j_i)$	$(2\tau + 4j_i + 2b) / (\tau + E_T^{\text{miss}} + 4j_i + 2b)$	$(2\tau + 2\tau) / (\tau + E_T^{\text{miss}} + \tau + b)$	$(2\tau + 2j_i + 2b + 2\tau) / (\tau + E_T^{\text{miss}} + 2j_i + 3b + \tau)$
$\tilde{t}_L(\tilde{b}_L)$	$(2\tau + 2j_3 + 4j_i) / (\tau + E_T^{\text{miss}} + 2j_3 + 4j_i)$	$(2\tau + 2j_i + 2b + 2j_i) / (\tau + E_T^{\text{miss}} + 2j_i + 2b + 2j_i)$	$(2\tau + 2j_i) / (\tau + E_T^{\text{miss}} + 2j_i + 2j_3 + b)$	$(2\tau + 2b) / (\tau + E_T^{\text{miss}} + 2j_3 + 3b + \tau)$
\tilde{t}_R	$(2\tau + 4j_i + 2j_3) / (\tau + E_T^{\text{miss}} + 4j_i + 2j_3)$	$(2\tau + 2j_i + 2j_3 + 2b) / (\tau + E_T^{\text{miss}} + 2j_i + 2j_3 + 2b)$	$(2\tau + 2j_i + 2l + 2b) / (\tau + E_T^{\text{miss}} + 2j_i + \tau + 3b)$	$(2\tau + 2j_3 + 2b + 2\tau) / (\tau + E_T^{\text{miss}} + 2j_3 + 3b + \tau)$
\tilde{b}_R	$(2\tau + 2b + 4j_i) / (\tau + E_T^{\text{miss}} + 2b + 4j_i)$	$(2\tau + 2j_i) / (\tau + E_T^{\text{miss}} + 2j_i)$	$(2\tau + 2j_i + 2l + 2b) / (\tau + E_T^{\text{miss}} + 2j_i + \tau + 3b)$	$(2\tau + 2\tau) / (\tau + E_T^{\text{miss}} + b)$
$\tilde{B}/\tilde{W}/\tilde{H}$	$(2\tau + 4j_i) / (\tau + E_T^{\text{miss}} + 4j_i)$	$(2\tau + 2j_i + 2b) / (\tau + E_T^{\text{miss}} + 2j_i + 2b)$	$(2\tau + 2\tau + 2j_i) / (1\tau + E_T^{\text{miss}} + \tau + b + 2j_i)$	$(2\tau + 2\tau + 2b) / (1\tau + E_T^{\text{miss}} + \tau + 3b)$

1. Four leptons: $4L + 4J$
2. Three leptons: $3L + E_T^{\text{miss}} + 4J$
3. Two leptons: $2L + \geq 2J$
4. One lepton: $1L + E_T^{\text{miss}} + \geq 2J$
5. Zero lepton: $4J (+E_T^{\text{miss}})$