**Trilepton signal**

An important feature of this channel is that the topology of the final state is dependent by the value of the model parameter, so that it is necessary to find a selection which allow its detection for an as large as possible parameter space.

1. Neutralino+Chargino production

The associated production of neutralino and chargino occurs via quark-antiquark annihilation through a W boson (in the s-channel) or through a squark exchange (in the t and u channel). In the following figure the production cross section (for the channels with leptonic decay of charginos and neutralinos) is shown.

2. Branching Fraction

The decay mode of the couple $\chi^+_1\chi^-_2$ depends on the value of the model parameters. In different parameter space regions, the most important decay modes yielding three-lepton final states are: (In the following $\equiv \mu,e$).

- $\tan\beta \sim 3$, $m_0 \leq 120$ GeV
  
  $\tilde{\chi}^0_2 \rightarrow \tilde{\nu}_L\nu, \tilde{\tau}_R\tau$;
  
  $\tilde{\chi}^\pm_1 \rightarrow \tilde{\nu}_L, \tilde{\tau}_L\nu$
• \( \tan \beta \sim 3, \ 120 \leq m_0 \leq 160 \text{ GeV} \)

\[
\tilde{\chi}^0_2 \rightarrow Z\tilde{\chi}^0_1 \rightarrow l\bar{l}\tilde{\chi}^0_1; \\
\tilde{\chi}^\pm_1 \rightarrow W\tilde{\chi}^0_1 \rightarrow l\nu\tilde{\chi}
\]

• for \( \tan \beta \) large the decay into \( \tau \) are dominant.

\[
\tilde{\chi}^0_2 \rightarrow \tilde{\tau}_1\tau; \\
\tilde{\chi}^\pm_1 \rightarrow \tilde{\tau}_1\nu
\]

An observed excess of \( \tau \) events would be important to point out a susy signature and in particular this would give information on the value of \( \tan \beta \)

3. Background

The dominant SM background for the trilepton + \( E_T \) is due to the following processes:

\[
q\bar{q}' \rightarrow W^*Z^*, W^*\gamma^* \rightarrow l\nu l\bar{l}, l'\nu' l\bar{l}; \\
q\bar{q}' \rightarrow W^*Z^*, W^*\gamma^* \rightarrow l\nu \tau\bar{\tau}, \tau\nu l\bar{l}; \\
q\bar{q} \rightarrow Z^*Z^*, Z^*\gamma^*, \gamma^*\gamma^* \rightarrow \tau\bar{\tau} l\bar{l}; \\
q\bar{q} \rightarrow t\bar{t}
\]