



Contribution ID: 372

Type: Poster

Stau searches at future e^+e^- colliders

The future electron-positron colliders offer excellent facilities for SUSY searches. With respect to previous e^+e^- colliders, they increase the luminosity and centre-of-mass energy and improve the technologies, while, with respect to hadron colliders, they offer a cleaner environment, a known initial state and a triggerless operation of the detectors.

Moreover, in contrast to hadron colliders, they are very well adapted to the colour neutral SUSY sector, one of the most relevant for SUSY and explanation of the main problems of the Standard Model and expected, for theoretical reasons and from results of the global fits, to have sufficiently light mass to be observable at these colliders.

Among the colourless SUSY particles, the superpartner of the tau-lepton, the stau, is one of the most interesting ones in SUSY searches.

The stau is likely to be the lightest of the sfermions, so the first SUSY particle that could be observed, and it can, for good reasons, be regarded as the worst and thus most general scenario for the searches: If one can find the stau, then any alternative next-to-lightest SUSY particle (NLSP) will also be findable.

In this contribution, a detailed study of the direct stau pair-production at the International Linear Collider (ILC) has been performed, showing the capability of this collider for determining stau exclusion/discovery limits in a model-independent way.

The studies were done using the full detector simulation and reconstruction procedures of the International Large Detector concept (ILD) at the ILC. The simulation included all SM backgrounds, as well as the beam induced ones. A detailed study of the effect of beam induced backgrounds, as overlay-on-physics and - for the first time - overlay-only events, in the stau limits was performed. The analysis of the worst mixing for stau searches at the ILC conditions is also included.

We are confident that this analysis confirms that at a linear e^+e^- collider, SUSY *will* be discovered if the NLSP mass is up to just a few GeV below the kinematic limit of the collider.

Collaboration / Activity

FTX-SLB SUSY searches

Primary author: NUNEZ PARDO DE VERA, Maria Teresa (FS-EC/FTX)

Co-authors: BERGGREN, Carl Mikael (FTX (FTX Fachgruppe SLB)); LIST, Jenny (FTX (FTX-SLB))

Presenter: NUNEZ PARDO DE VERA, Maria Teresa (FS-EC/FTX)

Session Classification: Poster session

Track Classification: Searches for New Physics