

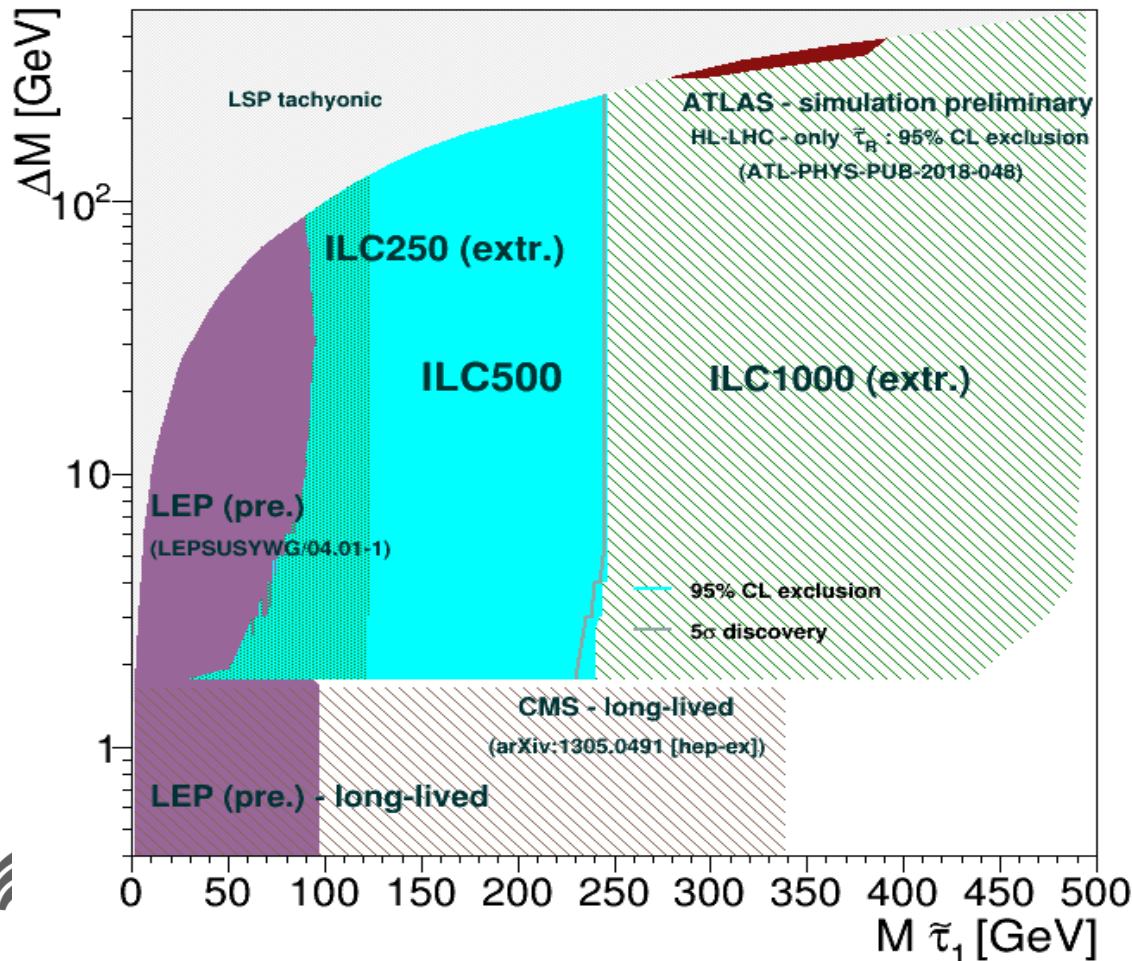
Status of $\tilde{\tau}$ searches at the ILC

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DESY

- Summary last presented results
- Analysis of worst scenario
- Outlook/Conclusions

Summary last presented results



$\tilde{\tau}$ mixing angle 53 degrees

$P(e^-, e^+) = (+80\%, -30\%)$

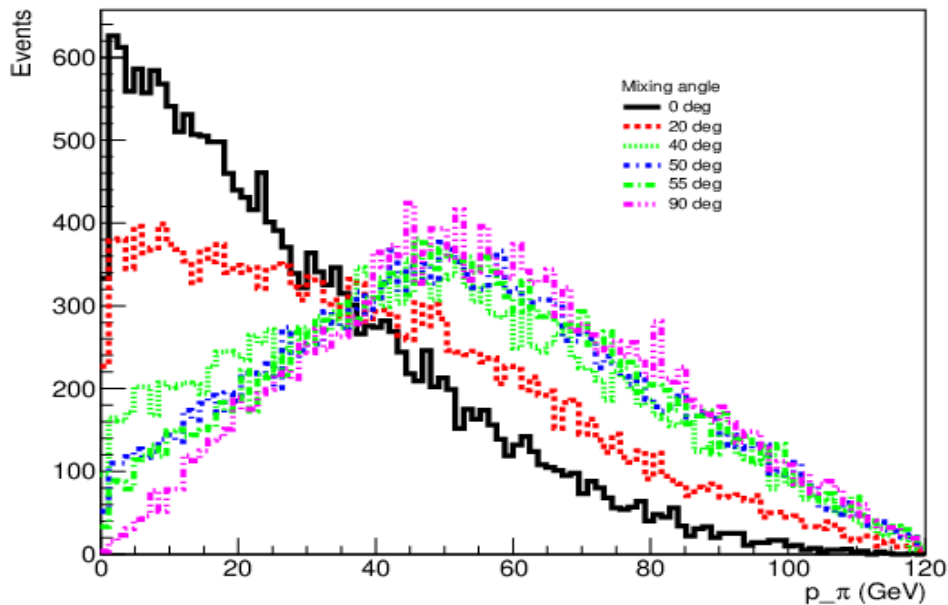
$\sqrt{s} = 500 \text{ GeV}, 1.6 \text{ ab}^{-1}$



Analysis of worst scenario

Dependence of signal efficiency on $\tilde{\tau}$ mixing

Bino LSP, $m_{\tilde{\tau}} = 200$ GeV, $\Delta m = 100$ GeV

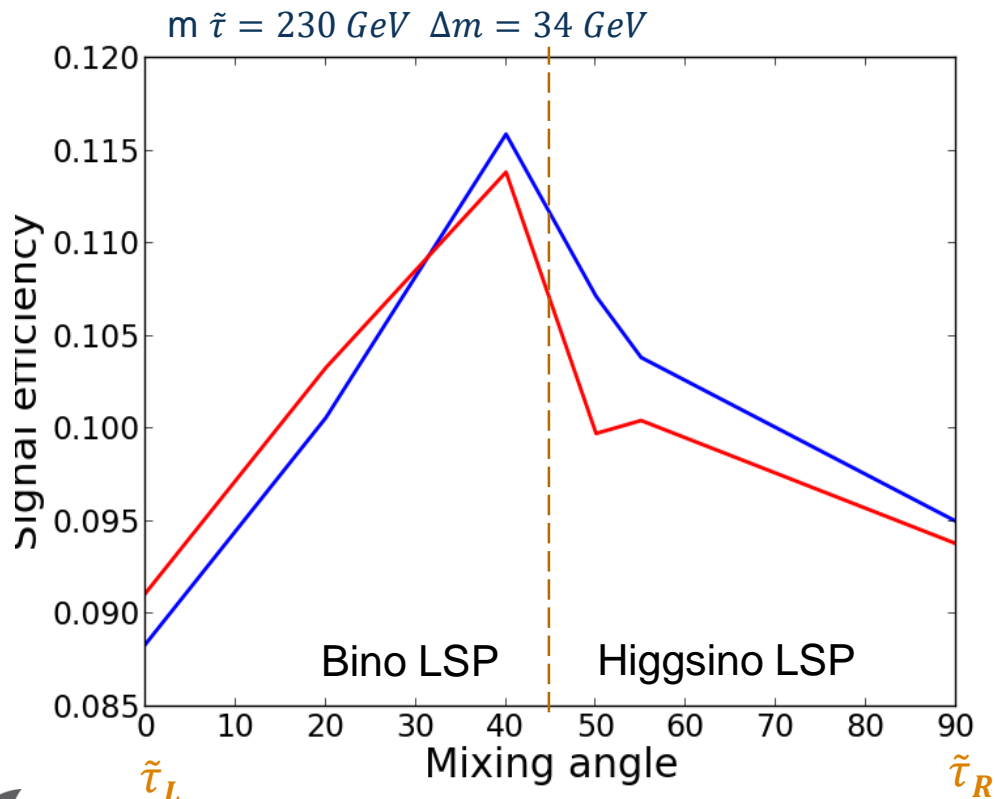


- Signal efficiency depends on spectrum of detectable τ decays
- Spectrum of τ decay products depends on τ polarisation
- τ polarisation depends on $\tilde{\tau}$ and LSP mixing angles

Higgsino changes chirality but Bino does not

Analysis of worst scenario

Dependence of signal efficiency on $\tilde{\tau}$ mixing

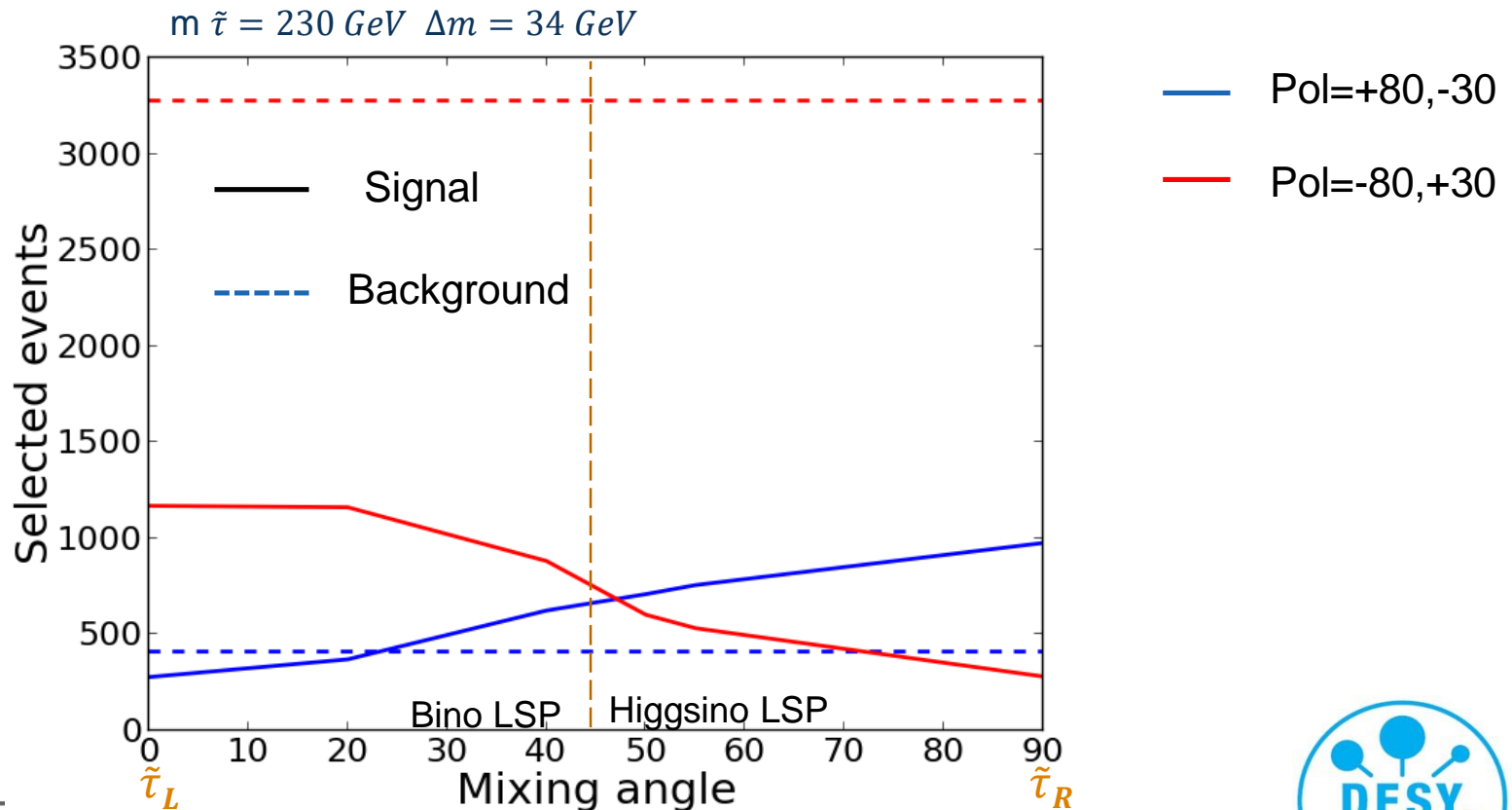


- Pol=+80,-30
- Pol=-80,+30

“Worst” LSP mixing depends on dominant $\tilde{\tau}$ component

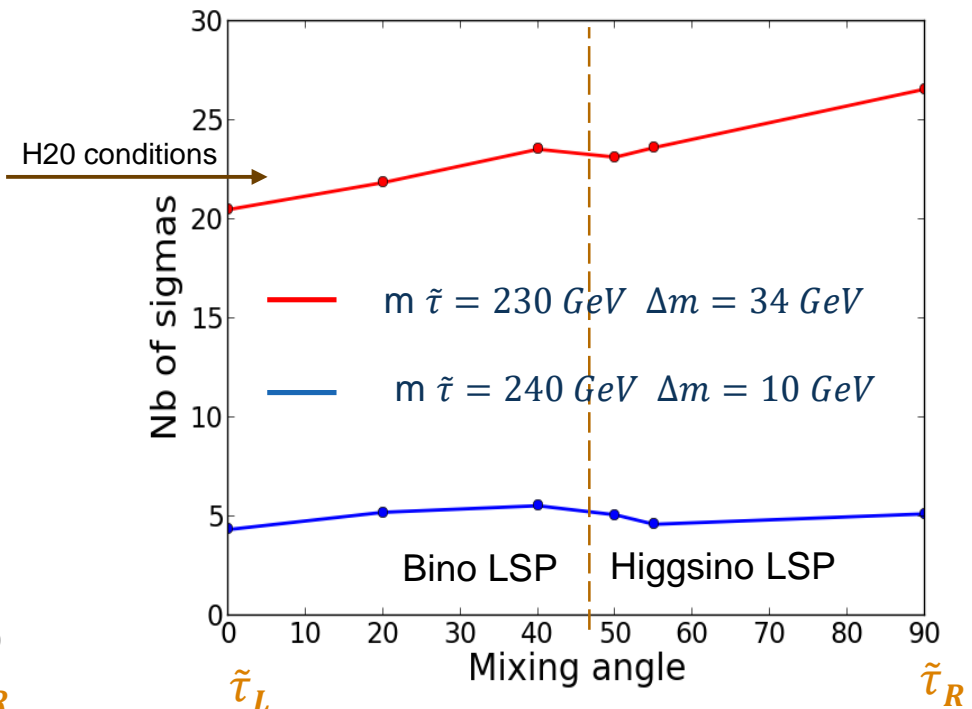
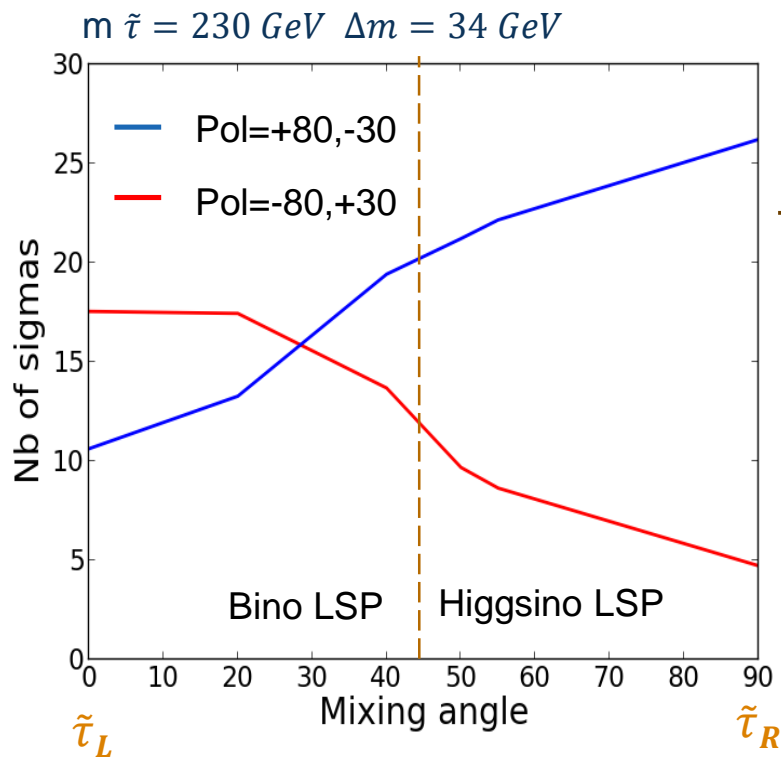
Analysis of worst scenario

Selected background and signal events



Analysis of worst scenario

Likelihood-ratio statistic used to weight both polarisations



No big effect of mixing angle
Worst mixing affected by background cuts optimization

Outlook/Conclusions

- Worst scenario for $\tilde{\tau}$ production at the ILC was reviewed taking into account ILC beam polarisation conditions
- Dependence of spectrum of visible products from τ decays on $\tilde{\tau}$ and LSP mixings (via τ polarisation) was taken into account
- Cuts optimized $P(e^-, e^+) = (+80\%, -30\%)$. Maybe possible improvement using different cuts depending on beam polarisation

**No big effect of mixing angle on worst scenario
53 deg worst case for low Δm**