Gaugino Least Squares Fits

Tim Barklow (SLAC)
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Comparison for 2D fits with N = 20 bins

Parameter:	Tim	Philipp
ΔM(Ch1)	4.2 GeV	6.1 GeV
ΔM(Neu1)	2.4 GeV	2.8 GeV
ΔM(Neu2)	7.5 GeV	7.1 GeV
Δσ(Ch1Ch1)/σ(Ch1Ch1)	2%	2%
Δσ(Neu1Neu1)/σ(Neu1Neu1)	2%	2%
Δσ(Neu2Neu2)/σ(Neu2Neu2)	3%	3%

FullMC Simulation L=2 ab^{-1}

Simultaneous Fit $\sigma(e^+e^- \to \tilde{\chi}_1^+ \tilde{\chi}_1^+)$, M($\tilde{\chi}_1^+$)

Nbin=100

$\Delta M(\tilde{\chi}_1^+) = 3.72$ GeV

$\frac{\Delta\sigma(\tilde{\chi}_1^+\tilde{\chi}_1^-)}{\sigma(\tilde{\chi}_1^+\tilde{\chi}_1^-)} = 1.9\%$

Nbin=50

$\Delta M(\tilde{\chi}_1^+) = 4.44$ GeV

$\frac{\Delta\sigma(\tilde{\chi}_1^+\tilde{\chi}_1^-)}{\sigma(\tilde{\chi}_1^+\tilde{\chi}_1^-)} = 1.9\%$

Nbin=20

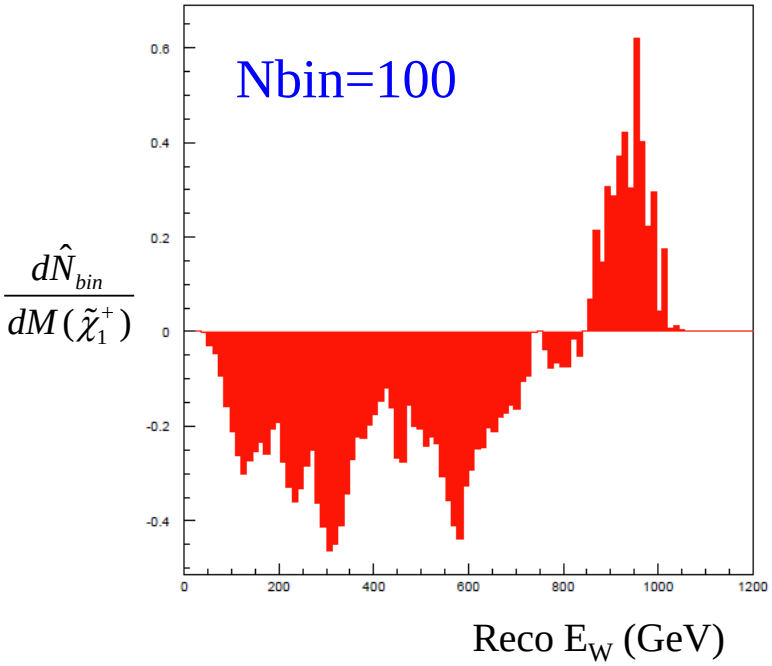
$\Delta M(\tilde{\chi}_1^+) = 4.22$ GeV

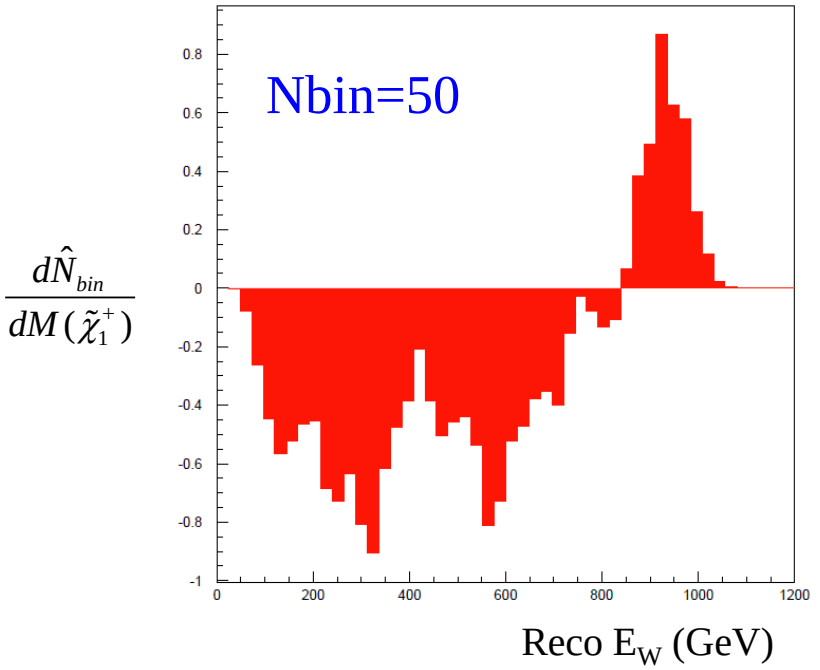
$\frac{\Delta\sigma(\tilde{\chi}_1^+\tilde{\chi}_1^-)}{\sigma(\tilde{\chi}_1^+\tilde{\chi}_1^-)} = 1.9\%$

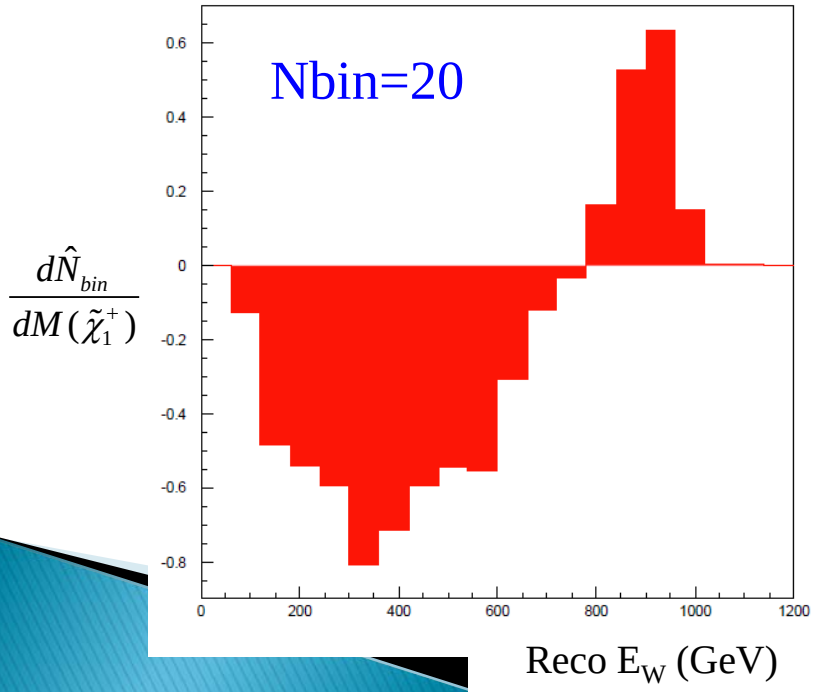
Nbin=10

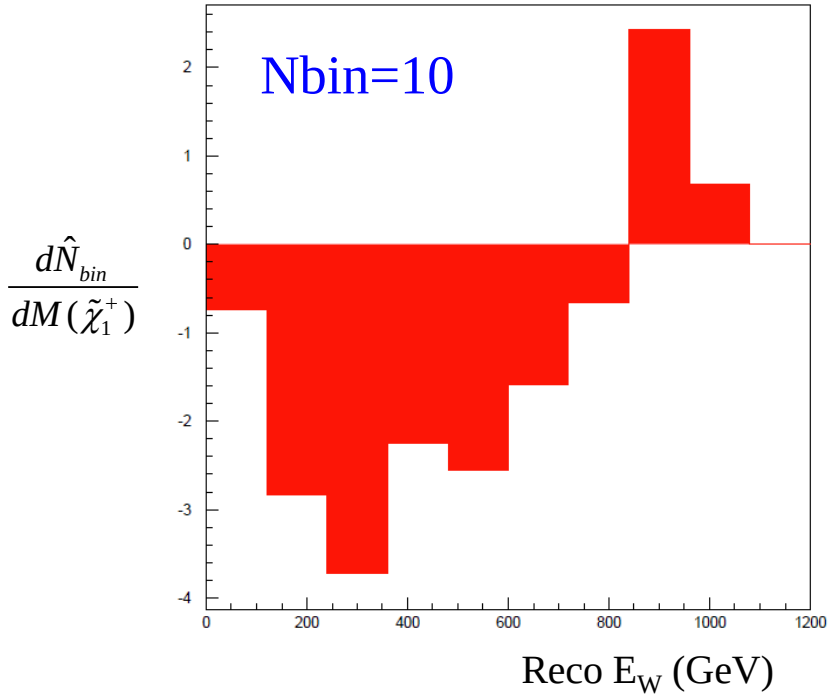
$\Delta M(\tilde{\chi}_1^+) = 5.65$ GeV

$\frac{\Delta\sigma(\tilde{\chi}_1^+\tilde{\chi}_1^-)}{\sigma(\tilde{\chi}_1^+\tilde{\chi}_1^-)} = 2.0\%$


Nbin=100
$\frac{d\hat{N}_{bin}}{dM(\tilde{\chi}_1^+)}$
Reco E_W (GeV)


Nbin=50
$\frac{d\hat{N}_{bin}}{dM(\tilde{\chi}_1^+)}$
Reco E_W (GeV)


Nbin=20
$\frac{d\hat{N}_{bin}}{dM(\tilde{\chi}_1^+)}$
Reco E_W (GeV)


Nbin=10
$\frac{d\hat{N}_{bin}}{dM(\tilde{\chi}_1^+)}$
Reco E_W (GeV)

FullMC Simulation L=2 ab^{-1}

Simultaneous Fit $\sigma(e^+e^- \to \tilde{\chi}_1^+\tilde{\chi}_1^+)$, M($\tilde{\chi}_1^+$) and other parameters

Nbin=20

3 Parameter Fit

$\Delta M(\tilde{\chi}_1^+) = 17.4$ GeV

$\frac{\Delta\sigma(\tilde{\chi}_1^+\tilde{\chi}_1^-)}{\sigma(\tilde{\chi}_1^+\tilde{\chi}_1^-)} = 4.8\%$

$\Delta M(\tilde{\chi}_1^0) = 10.0$ GeV

$\rho(M(\tilde{\chi}_1^+), M(\tilde{\chi}_1^0))$=0.97

$\rho(M(\tilde{\chi}_1^+), \sigma(\tilde{\chi}_1^+\tilde{\chi}_1^-))$=0.93

$\rho(M(\tilde{\chi}_1^0), \sigma(\tilde{\chi}_1^+\tilde{\chi}_1^-))$=0.92

3 Parameter Fit

$\Delta M(\tilde{\chi}_2^0) = 59.6$ GeV

$\frac{\Delta\sigma(\tilde{\chi}_2^0\tilde{\chi}_2^0)}{\sigma(\tilde{\chi}_2^0\tilde{\chi}_2^0)} = 12.5\%$

$\Delta M(\tilde{\chi}_1^0) = 32.9$ GeV

$\rho(M(\tilde{\chi}_2^0), M(\tilde{\chi}_1^0))$=0.99

$\rho(M(\tilde{\chi}_2^0), \sigma(\tilde{\chi}_2^0\tilde{\chi}_2^0))$=0.97

$\rho(M(\tilde{\chi}_1^0), \sigma(\tilde{\chi}_2^0\tilde{\chi}_2^0))$=0.97

FullMC Simulation L=2 ab^{-1}

Simultaneous Fit $\sigma(e^+e^- \to \tilde{\chi}_1^+\tilde{\chi}_1^+)$, $M(\tilde{\chi}_1^+)$ and other parameters assuming external measurement of $M(\tilde{\chi}_1^0)$ with $\Delta M(\tilde{\chi}_1^0) = 3$ GeV

Nbin=20

3 Parameter Fit

$\Delta M(\tilde{\chi}_1^+) = 6.4$ GeV

$\frac{\Delta\sigma(\tilde{\chi}_1^+\tilde{\chi}_1^-)}{\sigma(\tilde{\chi}_1^+\tilde{\chi}_1^-)} = 2.3\%$

$\Delta M(\tilde{\chi}_1^0) = 2.9$ GeV

$\rho(M(\tilde{\chi}_1^+), M(\tilde{\chi}_1^0))=0.75$

$\rho(M(\tilde{\chi}_1^+), \sigma(\tilde{\chi}_1^+\tilde{\chi}_1^-))=0.63$

$\rho(M(\tilde{\chi}_1^0), \sigma(\tilde{\chi}_1^+\tilde{\chi}_1^-))=0.55$

3 Parameter Fit

$\Delta M(\tilde{\chi}_2^0) = 9.2$ GeV

$\frac{\Delta\sigma(\tilde{\chi}_2^0\tilde{\chi}_2^0)}{\sigma(\tilde{\chi}_2^0\tilde{\chi}_2^0)} = 3.2\%$

$\Delta M(\tilde{\chi}_1^0) = 3.0$ GeV

$\rho(M(\tilde{\chi}_2^0), M(\tilde{\chi}_1^0))=0.58$

$\rho(M(\tilde{\chi}_2^0), \sigma(\tilde{\chi}_2^0\tilde{\chi}_2^0))=0.48$

$\rho(M(\tilde{\chi}_1^0), \sigma(\tilde{\chi}_2^0\tilde{\chi}_2^0))=0.35$