MSSM tests via Higgs sector observables measured at LHC and LC:First thoughts

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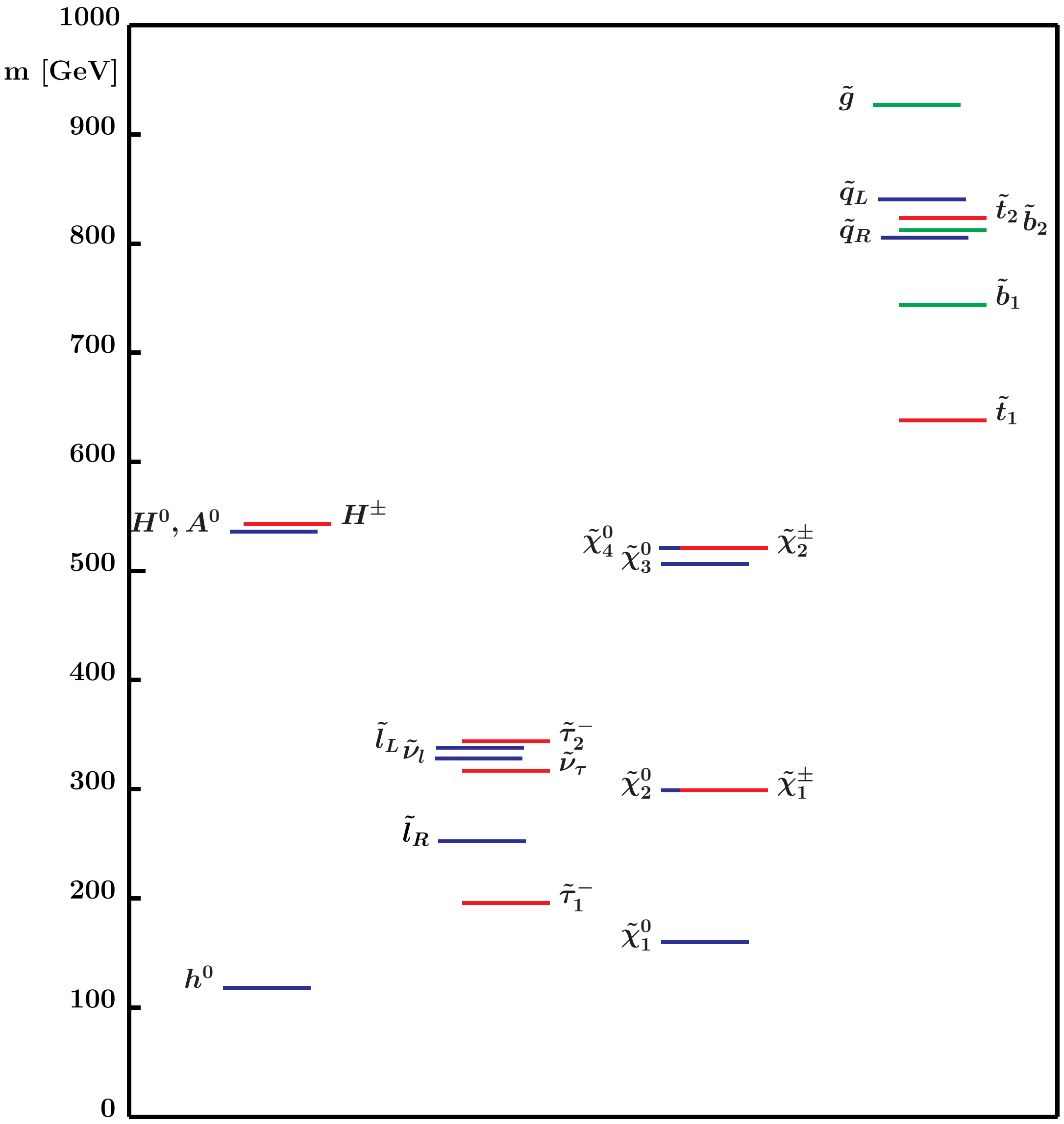
Question: how can experimental information from both LHC and LC be used to constrain/test the MSSM Higgs sector predictions?

Model assumption: SPS 1b



SPS1b: 'typical mSUGRA, large tanβ'

m_0 = **200 GeV**

$m_{1/2}$ = **400 GeV**

$\tan\beta = 30$

sign(μ) = +

$A_0 = 0$

$\longrightarrow$ A **accessible at LHC**

$\longrightarrow$ $\tilde{t}, \tilde{b}$ **accessible at LHC**

$\longrightarrow$ h **at LC and LHC**

A very first look:

Experimental assumptions:

LHC:

$\Delta M_A = 15\%$ (F.Moortgat, maybe better with full Lumi)

$\Delta M_{\tilde{t},\tilde{b}} = 5\%$

$\Delta \tan\beta = 15\%$

$\Delta m_h = 0.5$ GeV (LHC/LC incl. theory uncertainty in prediction)

LC:

$\Delta m_h = 0.5$ GeV (LHC/LC incl. theory uncertainty in prediction)

$\Delta m_t = 100$ MeV

LC precision measurements of h BR's

Scan of theory space (FeynHiggs):

$\sim$ 200k points varying:

$25.5 < \tan\beta < 34.5$

$200\text{GeV} < m_A < 1000\text{GeV}$

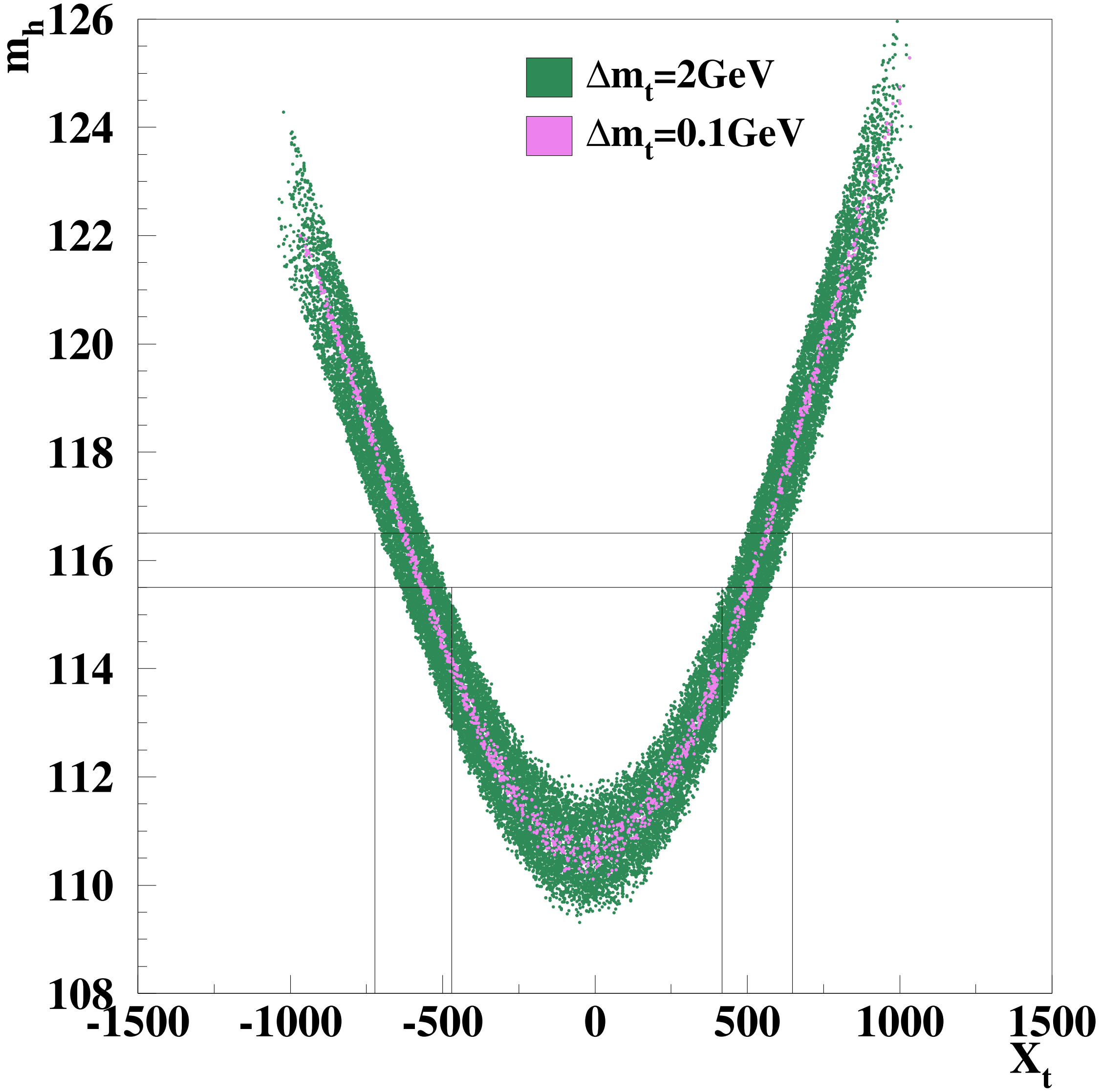
400 GeV $< m_{\tilde{t}_1}, m_{\tilde{t}_2}, m_{\tilde{b}_1}, m_{\tilde{b}_2} < 2000$ GeV

$\tilde{t}, \tilde{b}$-mixing: full allowed region (approx. SU(2) constraint: $M_{\tilde{t}_L} = M_{\tilde{b}_L} \pm 10\%$)

170 GeV $< m_t <$ 180 GeV

$M_2 = 310$ GeV, $\mu = 500$ GeV: fixed

Very first results:



Very first results: