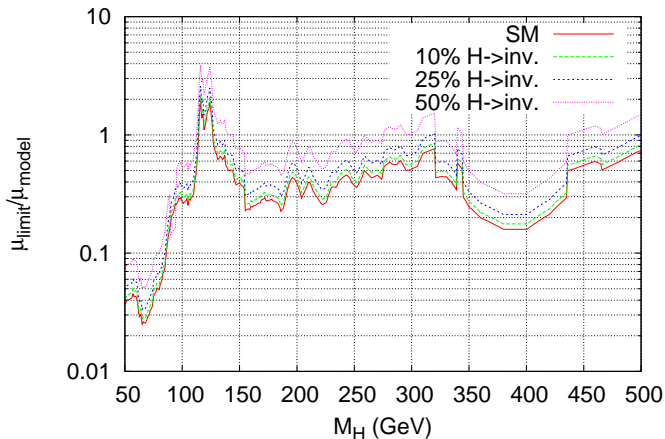


Tutorial - exercise 1

The invisible Higgs

Example applications: (II) SM with invisible Higgs decay

Toy example: Standard Model Higgs + Higgs decay mode $H \rightarrow$ invisible.



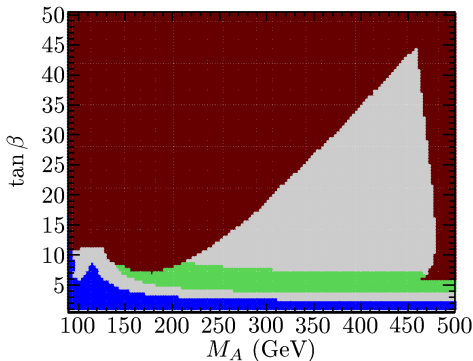
For $\mathcal{B}(H \rightarrow \text{inv.}) \leq 25\%$, the excluded mass region does not change much w.r.t SM.

Tutorial - exercise 2

MSSM with a ≈ 125 GeV Higgs

Example applications: (III) MSSM: m_h^{\max} scenario

[S. Heinemeier, O. Stål, G. Weiglein: arXiv:1112.3026]



m_h^{\max} benchmark scenario:

$M_1 = 100$ GeV, $M_2 = 200$ GeV,
 $M_{\text{SUSY}} = 1$ TeV, $X_t = 2M_{\text{SUSY}}$,
 $m_{\tilde{g}} = 0.8M_{\text{SUSY}}$, $\mu = 200$ GeV,
 $A_b = A_t$.

LEP excluded

LHC excluded

$m_h = 125 \pm 3$ GeV

- Exclusions from $pp \rightarrow h/H/A \rightarrow \tau^+\tau^-$ (CMS) and $e^+e^- \rightarrow hZ \rightarrow (b\bar{b})Z$ (LEP).
- For $pp \rightarrow H/A \rightarrow \tau^+\tau^-$ (CMS), signal rates of H and A have been combined if $|m_H - m_A| \leq 10$ GeV.
- at high M_A : exclusion from SM Higgs search combination (CMS).