

SASS Progress Report

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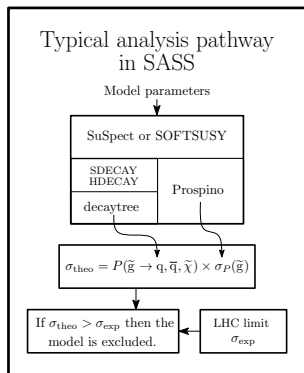
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SASS – Supersymmetry Analysis using Simplified models

- Automatically applying Simplified Models results on SUSY points.
- 2k lines of Python.
- Currently uses the T1, T1bbbb, T1tttt, T2, T2bb, T2tt results from CMS.
- Very easy to answer questions such as $BR(\tilde{g} \rightarrow b(\tilde{b} \rightarrow t(\tilde{\chi}^\pm \rightarrow W^\pm \tilde{\chi}^0))) = ?$



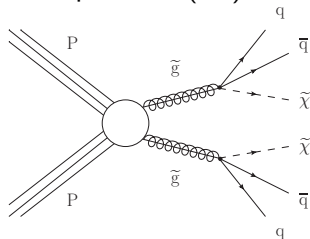
The SASSy Approach

Currently only use BRs to calculate P_{sig} . No MC of our own. Only use the exp. results. We wanted to see how far this takes us.

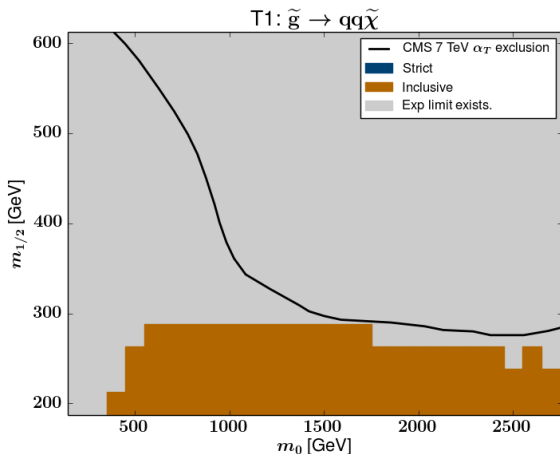
Two approaches to calculating P_{sig} :

- 1 'Strict': $P_{\text{sig}} = [BR(\tilde{g} \rightarrow qq\tilde{\chi}^0)]^2$
- 2 'Inclusive': $P_{\text{sig}} = [P(\text{at least } qq\tilde{\chi}^0 | \tilde{g} \rightarrow \text{SM particles} + \tilde{\chi}^0)]^2$
(disallowing any decays via \tilde{q} , so 'semi-inclusive' rather than 'inclusive')

Example SMS (T1)

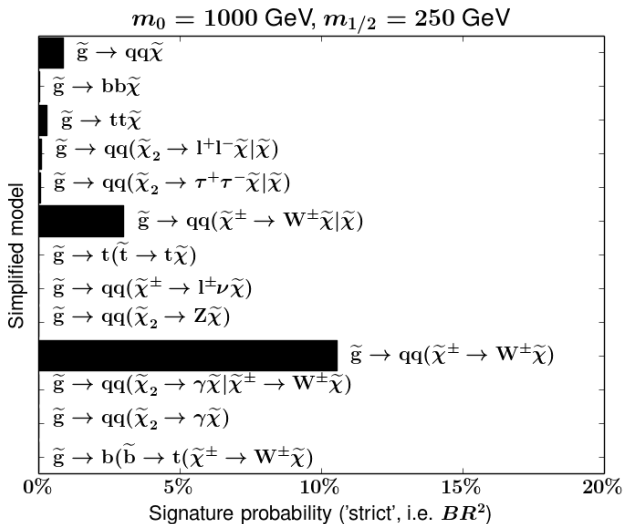


The cMSSM plane ($\tan(\beta) = 10$, $A_0 = 0$ GeV, $\mu > 0$)



Exclusion contour from CMS SUS11022,
Simplified models limits from CMS SUS12028

cMSSM point projected onto the gluino models of CMS



Outlook for SASS

Two ways forward for using SASS to constrain models:

- ① The 'strict' approach using results from several different simplified models. This method is of course severely limited by available SMS results.
- ② The 'inclusive' approach by, most probably, doing Monte Carlo to include contributions from cascade decays when applying the direct decay simplified model results.

I'm also very much interested in collaboration. I'm new PhD student in Amsterdam, so I've got plenty of time...