

Status of the Fittino-ScyNet-SModelS Project

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Abstract

1 Introduction

This document summarizes the current status of the project.

1.1 To Clarify

I am not sure about the meaning of these entries in the results root file:

- ("SModelSCalculator_UnusedModel_0__Weight")
- ("SModelSCalculator_UnusedModel_0__Bracket")
- ("SModelSCalculator_UnusedModel_0__TxName")
- ("SModelSCalculator_UnusedModel_0__FractionOutsideGrid")
- ("SModelSCalculator_ConstraintOutsideGrid_0__Weight")
- ("SModelSCalculator_ConstraintOutsideGrid_0__Bracket")
- ("SModelSCalculator_ConstraintOutsideGrid_0__Bracket")
- ("SModelSCalculator_MissingConstraint_0__Weight")

2 Results

In this Section I summarize briefly the results from the first, preliminary scan of points that Bjorn provided.

2.1 Mass Distributions

In Fig. 2 the distributions of the masses of the scanned points are shown; in particular, all the coloured particles have very large masses exceeding 2 TeV, so that essentially only electroweak productions have reasonable cross sections. This configuration of mass parameters is very challenging for **SModelS**, since basically EMs for squark are produced up to around 1 TeV, and gluino EMs for up to 1.5 TeV (but cross sections should be very small in any case to contribute significantly).

Concerning the Electroweak simplified models, they are very poorly covered: only TSlep-Slep (slepton production and direct decay) and TChiWZ (chargino-neutralino2 production but strictly mass degenerate) are essentially covered.

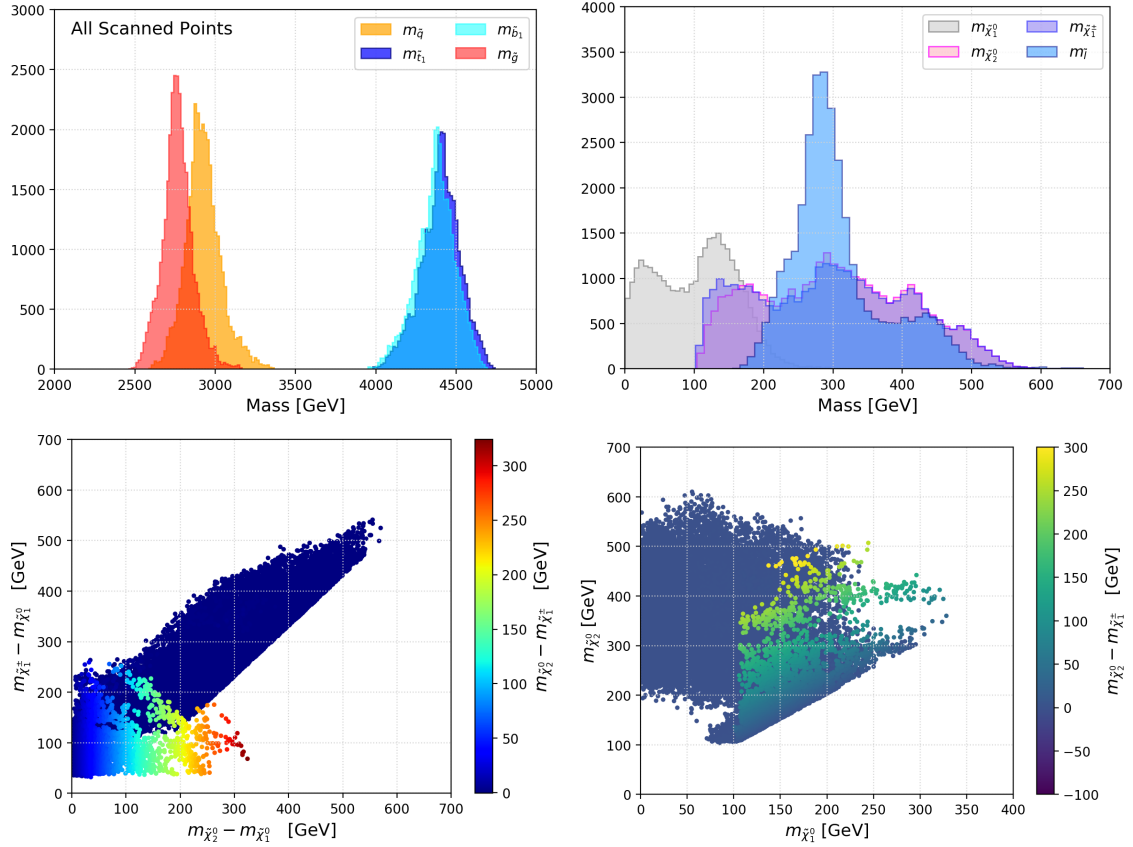


Figure 1. Distributions of the masses of the SUSY particles of the first set of points.

2.2 Missing TxNames and Missing Brackets

Here I list the most frequent (at least > 100 times) missing TxNames and missing brackets, with the largest weight ($\sigma \times BR$) for each point. I am not sure about the interpretation of the two definitions, so I hope Bjorn will clarify this.

```
('TChiChipmhiggs_W_', 136)
('TChiChipmZW_WW_', 144)
('TChiChipmqq_W_', 166)
(' ', 401)
('TChiChipm__', 540)
('TChiChipmmu__', 639)
('TChiChipmWoff_Woff_', 950)
('TChiChipm_Woff_', 1341)
('TChiChipmZoff_Woff_', 1569)
('TSnuSnu__', 3249)
('TChiChipm_W_', 3621)
('TChiChi__', 5481)
('TChiChipme__', 8087)

('[[[W],[W]],[[Z],[W]]]', 160)
('[[[jet,jet]],[[photon]]]', 176)
('[[[]],[[l,nu]]]', 179)
('[[[W]],[[jet,jet]]]', 184)
(' ', 401)
('[[[]],[[W]]]', 1431)
('[[[]],[[jet,jet]]]', 1648)
('[[[jet,jet]],[[l,nu]]]', 1856)
('[[[W]],[[l,nu]]]', 2124)
('[[[]],[[]]', 4794)
('[[[]],[[l]]]', 13435)
```

There are some things that I cannot explain, e.g.

- The difference between 'TChiChipme' and the '[[[]],[[l]]]' constraint? Are those referring to the same topology?
- Why "TChiChipmmu" is much less frequent than "TChiChipme"?
- What is "TSnuSnu" ?

3 Outside of the grid

List of constraints present in the **SModelS** database which do not however cover the region in the mass parameter spaces of the tested points:

```

[[[jet]], [[jet]]] 6645
[[[1], [1]], [[1], [nu]]] 5476
[[[jet, jet]], [[jet, jet]]] 2912

```

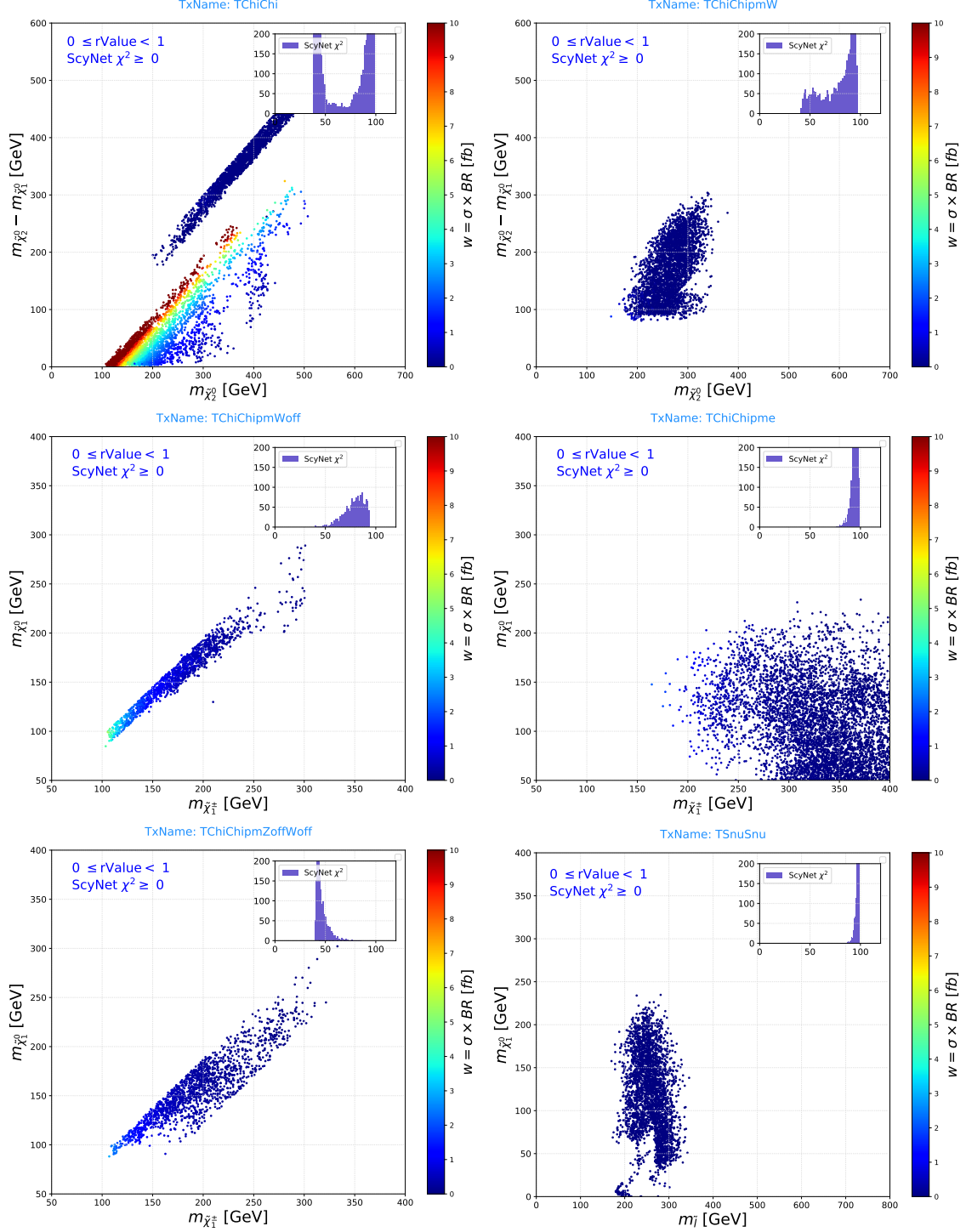


Figure 2. Weights $\sigma \times BR$ [fb] for the most frequent missing topologies.

```

[[[1,1]], [[1,nu]]] 1754
[[[W]], [[higgs]]] 1727
[[[b,b]], [[jet,jet]]] 1356
[[[1,nu]], [[1,nu]]] 1152
[[[1],[1]], [[nu],[1]]] 643
[[[1],[nu]], [[ta],[ta]]] 611
[[[1],[1]], [[ta],[nu]]] 256
[[[jet],[W]], [[jet],[W]]] 155
[[[1],[nu]], [[nu],[1]]] 136
[[[W]], [[Z]]] 127

```

Fig- 3 shows the distributions of the weights for the most frequent cases:

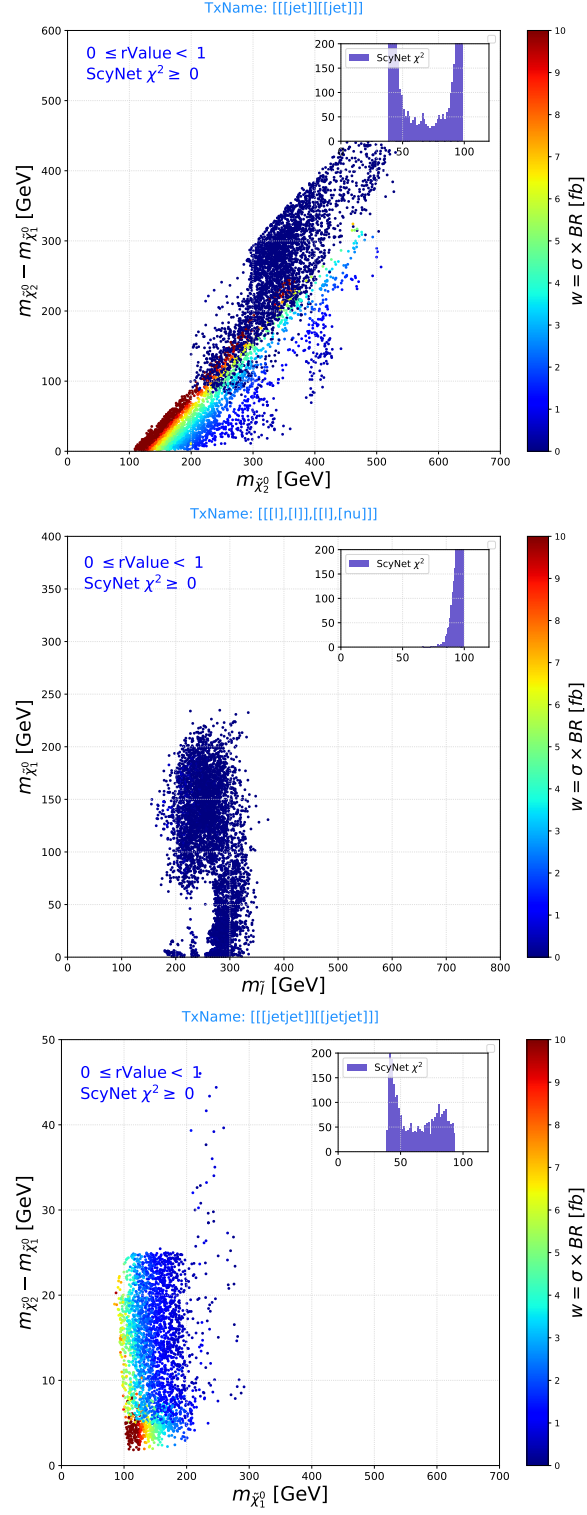


Figure 3. Weights $\sigma \times BR$ [fb] for the most frequent constraints falling outside of the grid

Acknowledgments

Thanks