

SUSY Working Group: Plans

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Outline

Studies in detector frameworks

Signals with QCD

Beyond mSUGRA

Interfaces

Parameter studies

Rock'n'Roll

Studies in detector frameworks

Evolution on standard SUSY scenarios

- ▶ matrix element reconstruction of DY-type channels [Barr, Giacomo...]
→ measure spins, masses, properties
- ▶ neutralino/chargino mixing from cascades and direct production [Barr, Giacomo,...]
→ measure LSP properties
- ▶ hemisphere and shape variables for SUSY [Giacomo, Moortgat, Nojiri...]
→ improved cascade analysis?
- ▶ off-shell effects on cascades analyses [Berdine, Kauer, Rainwater,...]
→ squark/gluino mass measurement?
- ▶ stop–chargino sector in SPS1a [Nojiri, Sfitter,...]
→ fill big fat gaping hole at LHC for Sfitter
- ▶ Higgsino-LSP or similar scenarios with W, Z cascades [Giacomo, Salam, TP, Zerwas,...]
→ LSP analysis

Signals with QCD

SUSY and jets

- ▶ reconstruction using jets [Giagomo, Nojiri, Raklev, Salam,...]
- PS v leading jets, reconstruction,...
- ▶ jet merging with SUSY cascades [Boudjema, Herquet, TP, Schumann,...]
- effect on spin measurement?

Backgrounds

- ▶ effects of background distributions on early analyses [Tovey,...]
- early SUSY searches
- ▶ theoretical uncertainties on backgrounds [Boudjema,...]
- ▶ high- p_T behavior of DY and top backgrounds
- wish list? [Tytgat,...]

Heavy flavors and SUSY

- ▶ bottom partons and SUSY (SUSY-Higgs) [Bernhardt, TP]
- continue Higgs fights from 2001
- ▶ heavy-flavor production merged [TP, Schumann,...]
- gluino cascade?

Beyond mSUGRA

Beyond simple unification

- ▶ Mirage mediation and NUHM [Giacomo, Sfitter,...]
→ measure $M_1 : M_2 : M_3$ using dark matter and LHC
- ▶ same edges but different dark matter [Giacomo, Kraml, Nojiri,...]
→ indirect constraints with edges
- ▶ gluinos decaying to stop-top [Giacomo, Kraml, Raclew,...]
→ light stop decays into 4-body final state
- ▶ (non-) unification of scalar sector a la Schmaltz [Sfitter,...]
→ how bad for LHC alone or with ILC information?

Stable massive particles

- ▶ co-annihilation stops at the LHC [Covi, Kraan, Kraml, TP]
→ extend gluino analysis and properly
- ▶ alternative scenarios with stable particles [Zalewski,...]

Interfaces

Interfaces for SUSY tools

- ▶ SUSY Les Houches Accord 2 [Allanach, Skands, Kreiss, Rauch,...]
→ interface Fortran and C++
- ▶ data base of complete SLHA2 information for SPS points [Kauer,...]
→ piece of cake once SLHA2 done?
- ▶ updated study on spectrum generators [Kraml, Sekmen, Tytgat...]
→ requested by CMS-BSM

Parameter studies

Sfitter/Fittino

- ▶ interface to dark matter and precision constraints [Lafaye, Kreiss, TP, Rauch,...]
- make Sfitter fit for current data plus LHC
- ▶ rate and BR information in Sfitter [Sfitter, Giacomo, Lester...]
- tackle focus point scenarios beyond mSUGRA
- ▶ $\tan\beta$ measurement from flavor [Jäger, TP, Spannowsky,...]
- for later use in Sfitter (if it works)
- ▶ 'inverse problem' and LHC Special O's [Muanza,...]
- blind analysis test
- ▶ fits beyond mSUGRA, Higgs plus stops [Cavanaugh, Buchmüller,...]
- subset of Sfitter-type analysis
- ▶ FeynHiggs plus flavor 'master code' [Cavanaugh,...]

Let's go and get some work done!

We know these are more projects than we have manpower for. So please sign up and decide what you want to do — tons of exciting options for young ambitious people....

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