

WG2 - New Physics with missing energy signatures working group

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Date

Introduction

- ❖ Motivation for BSM
- ❖ Connection with DM \rightarrow MET signatures
- ❖ Classification of theories (new symmetries, new gauge groups, new dimension)

Review of search results

“tell a story”

- ❖ Default CMSSM constraints
- ❖ Squark / Gluino, Multi-jet (+leptons) + MET - still pushing forward & filling gaps
- ❖ 3rd Generation Squarks - exploring natural SUSY
- ❖ EW Gauginos - exploring possible low-scale sparticles
- ❖ Non-SUSY MET
- ❖ More difficult analyses to continue during shutdown
- ❖ Implications of non-MET searches

Interpretation of results

- ❖ Implications for Popular Models
- ❖ Problematic signatures (compressed spectra, very long chains, etc)
- ❖ CMSSM+NUHM / Fits - all fitting groups write 1 page together
- ❖ pMSSM (3 groups)
- ❖ natural SUSY (natural SUSY people, S.P. Martin, H. Baer, ...)
- ❖ Beyond MSSM:
 - ❖ NMSSM - G. Belanger & J. Gunion
 - ❖ Extended U(1) MSSM - Werner Porod (Maybe BMSSM?)
- ❖ (Re)interpretation in other BSM (UED / Little Higgs): coord. with WG3
- ❖ Effective DM - Tim Tait

Discussion of Implications

- ❖ Naturalness - where do we stand now
- ❖ Implications of 125 GeV excess (SUSY breaking models, etc)
- ❖ Future facilities: **formulate the needs!**
 - ❖ LHC Upgrades - energy vs lumi
 - ❖ e+e- (energy stages, ILC/CLIC/LEP3)
- ❖ DM Searches: Effective DM / pMSSM / briefly discuss other DM scenarios

TOC

- ❖ Introduction: 1 page
- ❖ Review of search results: 5 pages
- ❖ Interpretation: 5-6 pages
- ❖ Discussion of implications: 3-4 pages
- ❖ Crucial needs: EXP<>TH communication
- ❖ Studies targeting the LHC upgrade physics case

<http://wg2-met.wikidot.com/>