

WG2: missing energy signatures

Towards the report

Contents

1. Introduction
2. Strategy and results of ATLAS and CMS searches
3. Interpretation of results and implications for specific models/scenarios
 - a. Status of constrained models (mostly CMSSM)
 - b. pMSSM
 - c. Natural SUSY, light stops
 - d. Electroweak gauginos
 - e. Compressed spectra
 - f. Higgsino LSP
 - g. NMSSM
 - h. SUSY with extra gauge groups
4. Dark matter connection
5. Executive summary

Everything has to fit
within 15 pages!

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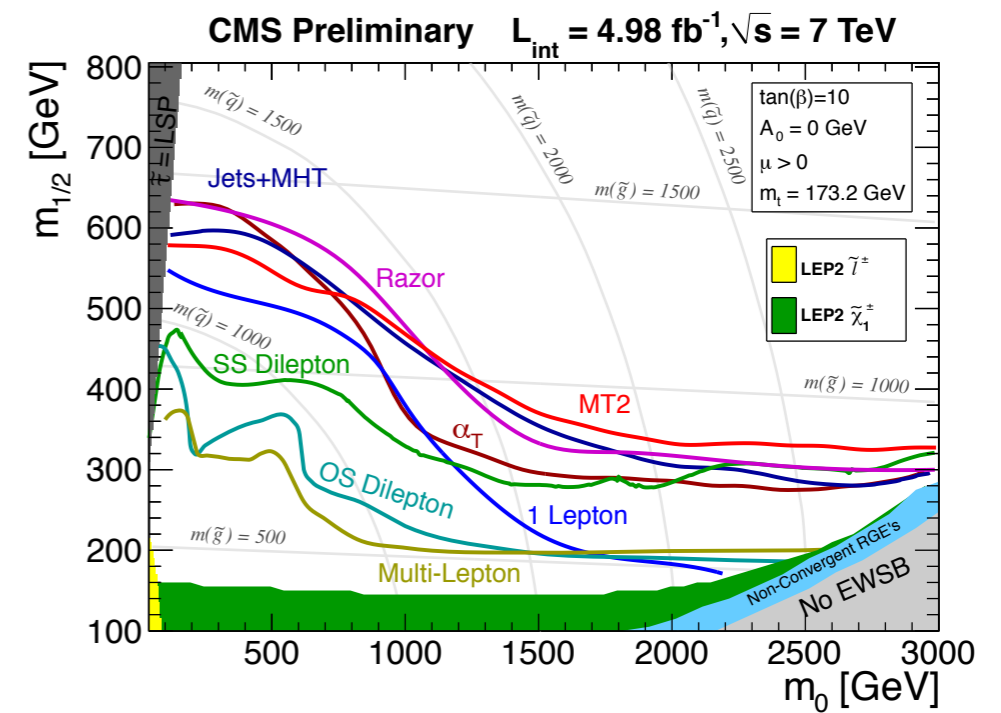
- 125 GeV Higgs as transversal topic
- prospects for future machines also transversal or only in summary?

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Status of constrained models, CMSSM

- 1 page contribution by fitting groups
- Tension between low energy / EW fit and direct search limits
- Higgs mass, fine-tuning
- CMSSM is being “pushed in the face”
- Statements in the writeup still rather vague, would be good to be more quantitative

→ Sven to provide chi2 plot ?

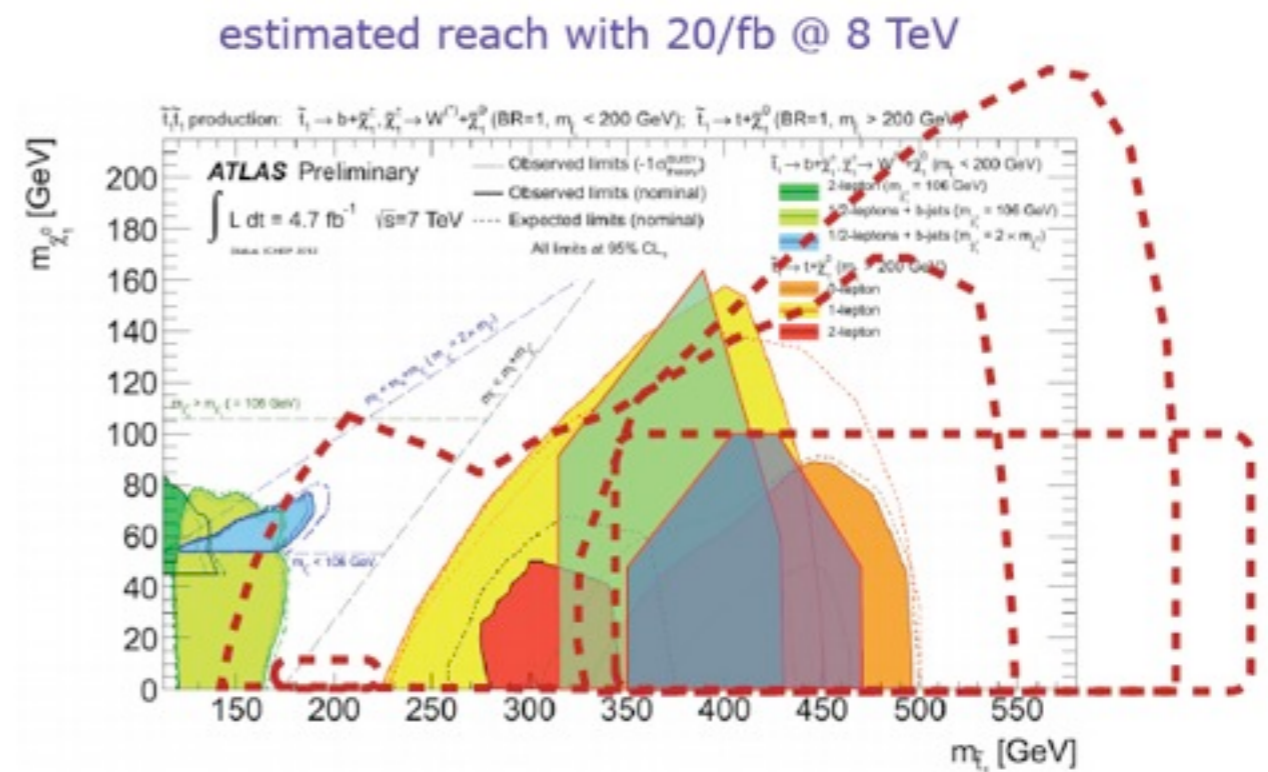


Natural SUSY, light stops

$$-\frac{m_Z^2}{2} = |\mu|^2 + m_{H_u}^2$$

- Motivation: naturalness, importance for understanding Higgs sector
- Short summary of current limits (and holes therein)
- Overview of new techniques
- Outlook: future machines

→ Daniele Alves



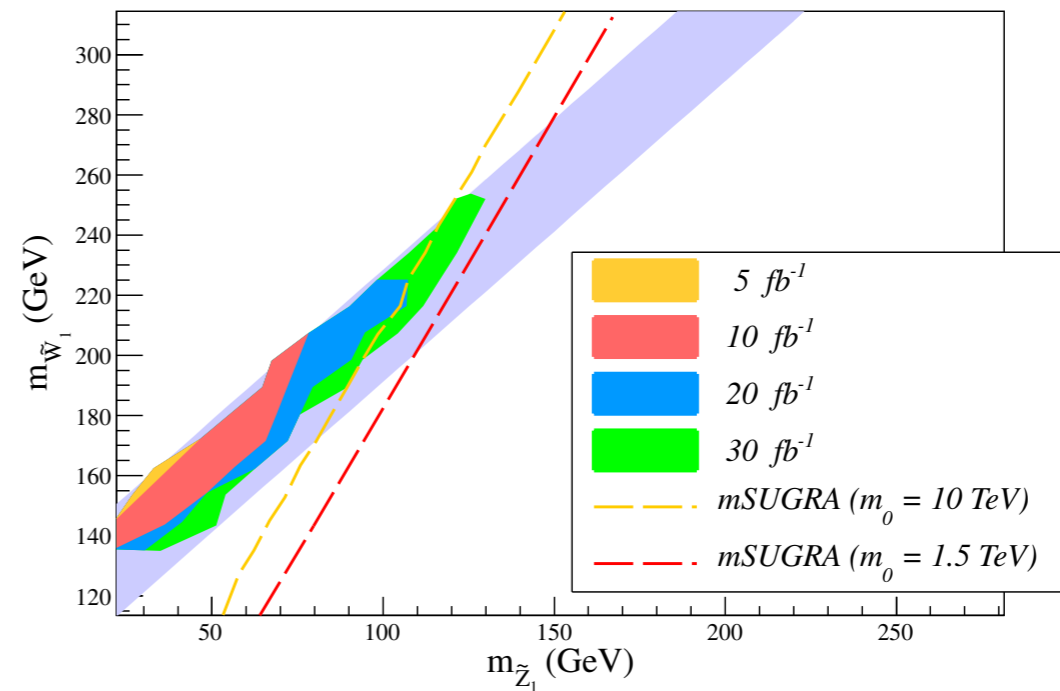
Light higgsinos

$$-\frac{m_Z^2}{2} = |\mu|^2 + m_{H_u}^2$$

- Same naturalness issue as for stops
- Intrinsically difficult at LHC (H. Bear: hidden SUSY)
- Short contribution by H. Bear exists but needs to be extended

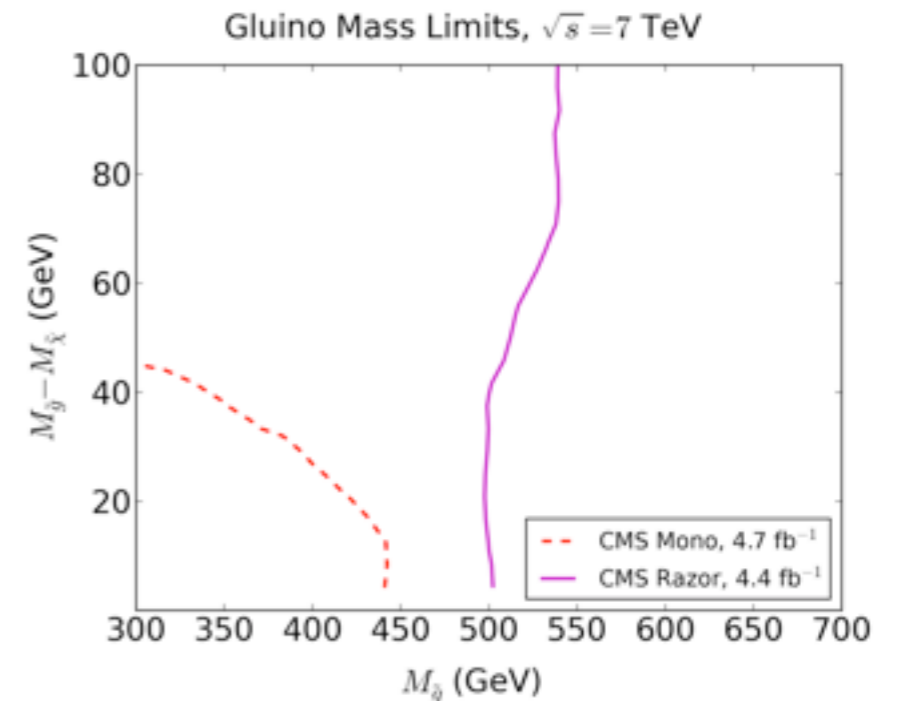
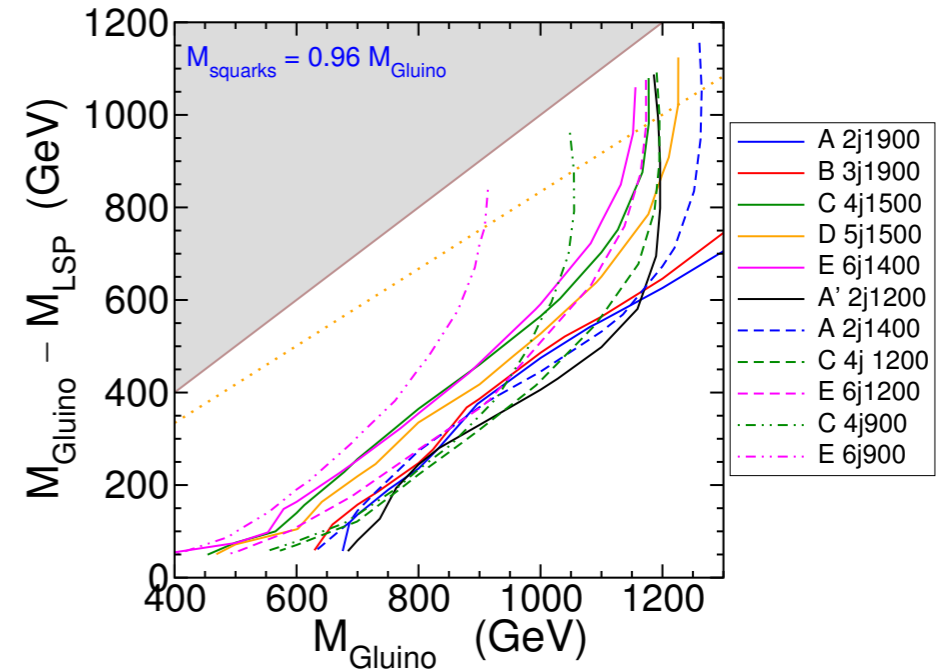
Electroweak gauginos

- ATLAS / CMS analyses not really sensitive so far
- Studies so far rely on intermediate sleptons
- Short section exists on potential for WZ+MET @ 8 TeV
- At 14 TeV also Wh + MET



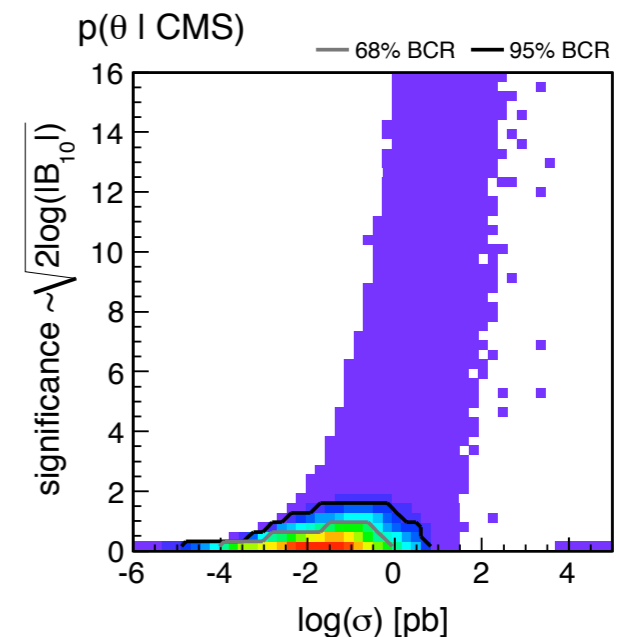
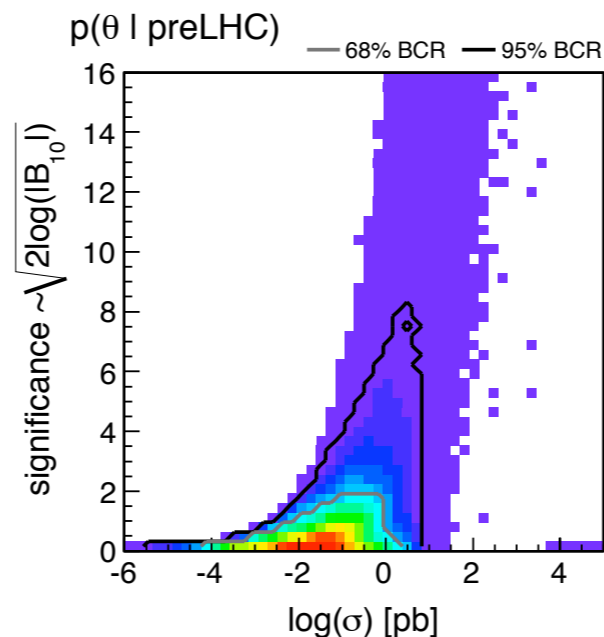
Compressed spectra

- Contribution by Steve Martin
- Some new material by Jamie Tattersall on monojet+MET, c.f. his talk yesterday
- Can probably much improve with higher luminosity



pMSSM

- Interesting for assessing the coverage for SUSY in general, pin down blind spots
- Different groups doing pMSSM studies, text still a bit incoherent
- Paragraph on SMS decomposition to come (W. Waltenberger)
- Need more on Higgs implications and finetuning (A. Ismail)



MSSM extension

- NMSSM → Ulrich Ellwanger, Jack Gunion
 - might be good to have a bit more on 125 GeV Higgs and light stops
- Extra gauge groups → Werner Porod

Dark Matter

- See experimental talks yesterday
- Need theorists' interpretation

Summary

- Michael Peskin's talk yesterday

