New Physics

What remains to be done?

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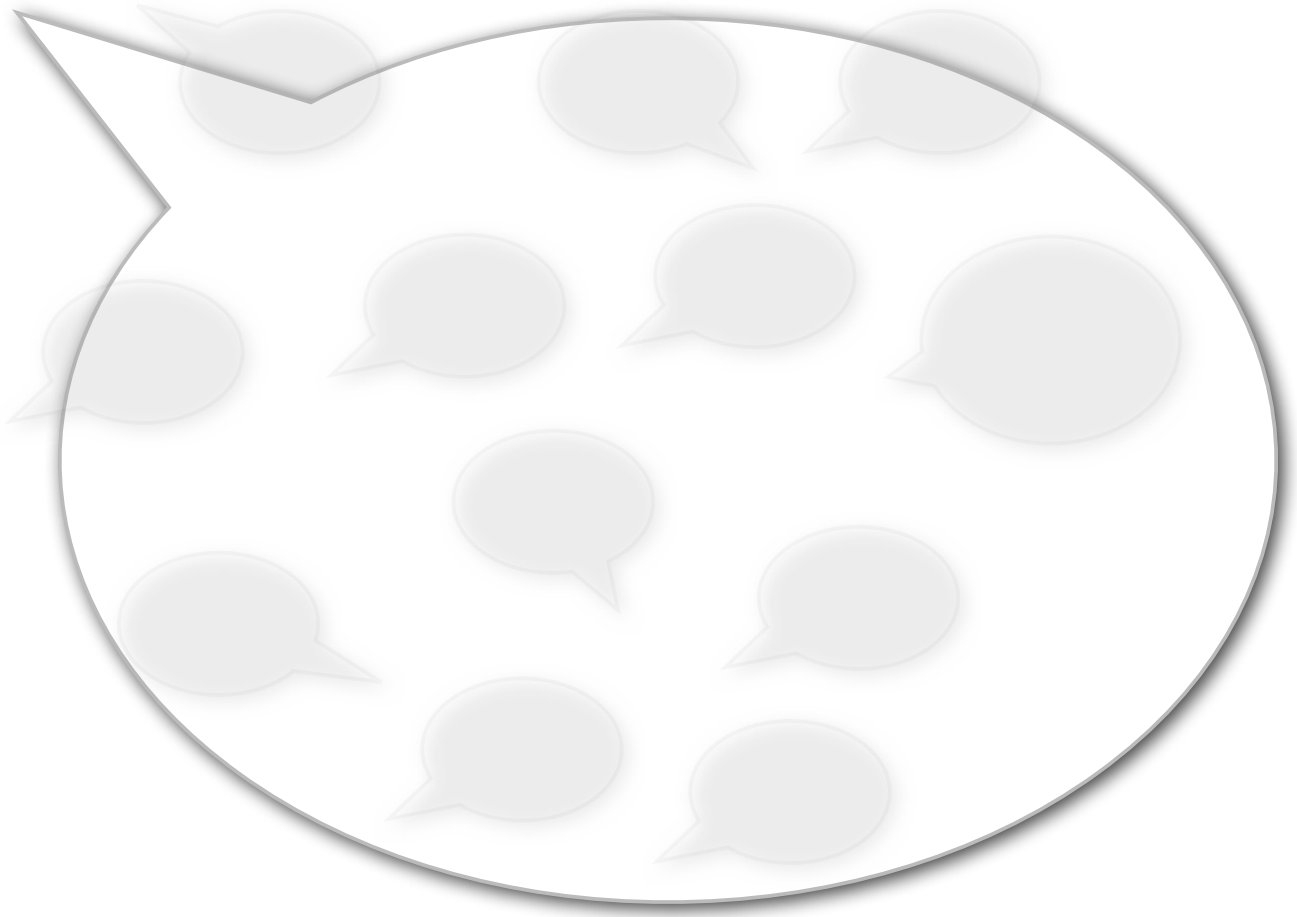
What we have

What we want



How to get there

Define a set of common models of broad interest
- UC Irvine benchmark meeting

Generate common signal and background samples

Recruit analyzers to do studies

Work, work, work, work

Look for holes

Work, work, work, work

Write, write, write, write

Discuss with broad community at Minneapolis

How to get there

Define a set of common models of broad interest - UC Irvine benchmark meeting	*Done*
Generate common signal and background samples	*Solid*
Recruit analyzers to do studies	*Done*
Work, work, work, work	*Doing!*
Look for holes	*This meeting*
Work, work, work, work	*July*
Write, write, write, write	*July*
Discuss with broad community at Minneapolis	

Stories

If you see _____ at LHC14,
what can you learn at potential future facilities?

1. SUSY in jets+MET
2. SUSY with light stop (with Top WG)
3. RPV SUSY
4. Heavy SUSY with leptons+MET
5. Nothing new
6. WIMPs via jet+MET
7. Heavy resonance
8. Invisible Higgs decay (with Higgs WG)
9. More Higgses (with Higgs WG)
10. Heavy quarks (with Top WG)
11. Quark or lepton compositeness

1. SUSY in jets+MET

LHC14: ATLAS, CMS whitepapers,
300/fb simp. models, pMSSM studies

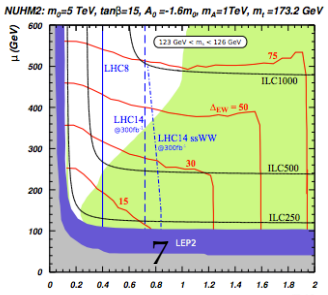
LHC14: pMSSM complex cascades
3/ab

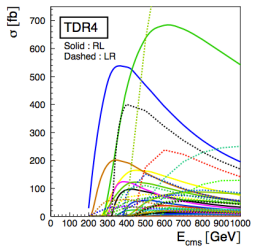
ILC: ILC whitepaper

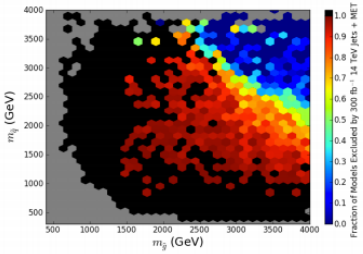
look for soft leptons from gaugino transitions

explore the gauginos

pp33: no dedicated studies to resolve multiple states







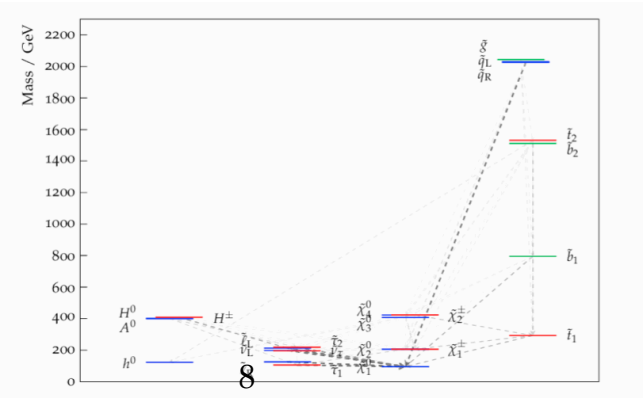
2. SUSY via stop

LHC14: ATLAS, CMS whitepapers,
300/fb stau co-annihilation models
MT2 search

LHC14: ATLAS, CMS WP,
3/ab stau co-annihilation studies

ILC: ILC whitepaper

pp33: simplified
sq-g scan



look for soft leptons from gaugino transitions

explore the gauginos, sleptons. Direct Det?

search for colored states

3. SUSY in leptons+MET

LHC14: ATLAS, CMS whitepapers,
300/fb simplified ewkinos,pMSSM studies

LHC14: simplified ewkinos
3/ab ATLAS, CMS whitepapers,

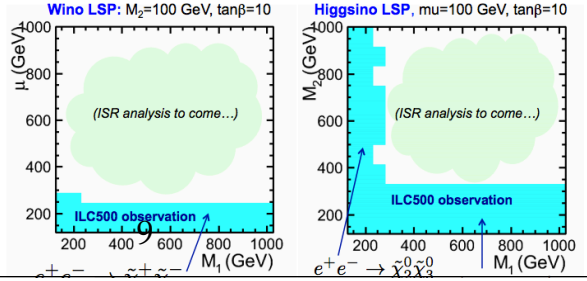
ILC: ILC whitepaper

pp33,100: simplified sq-g

measure mass differences look for heavy colored sparticles

explore gauginos

search for colored states



4. RPV SUSY in l+j res.

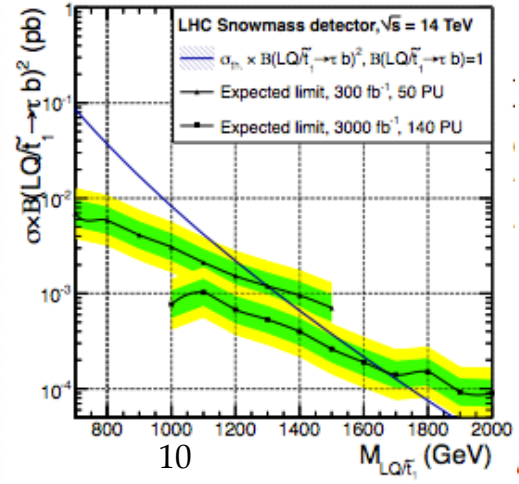
LHC14: LQ3/ bbtautau, stop->jj,
300/fb stop->top+jets

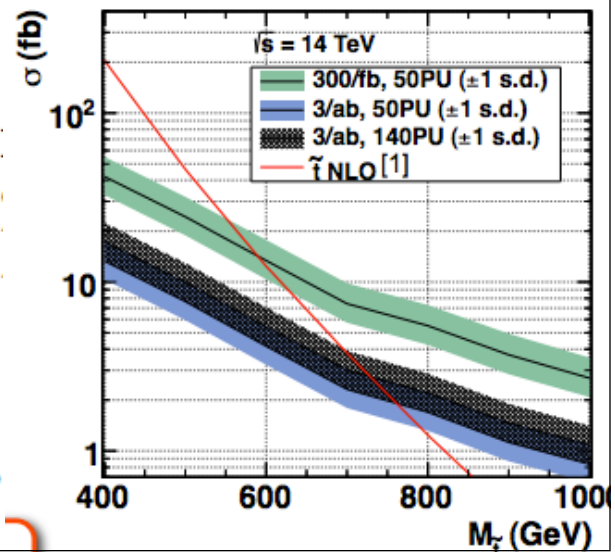
LHC14: stop->jj, stop->top+jets
3/ab LQ3/ bbtautau

ILC: N/A

pp33,100: no studies
some plans

Look for
more states





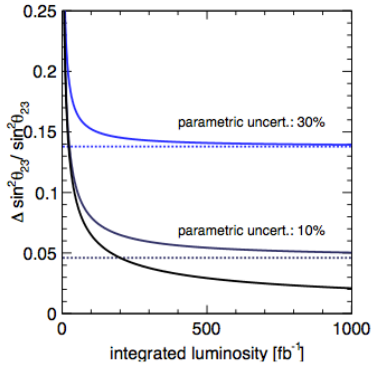
5. Nothing new

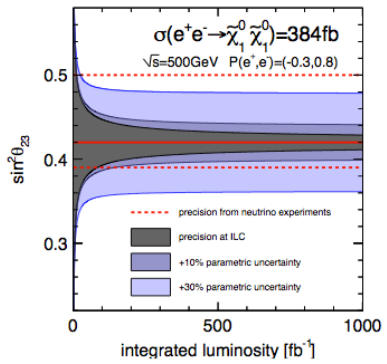
LHC14: See nothing
300/fb

LHC14: keep looking
3/ab

ILC: Higgs, Z precision studies, connections with neutrino mixing experiments.

pp33,100: keep looking





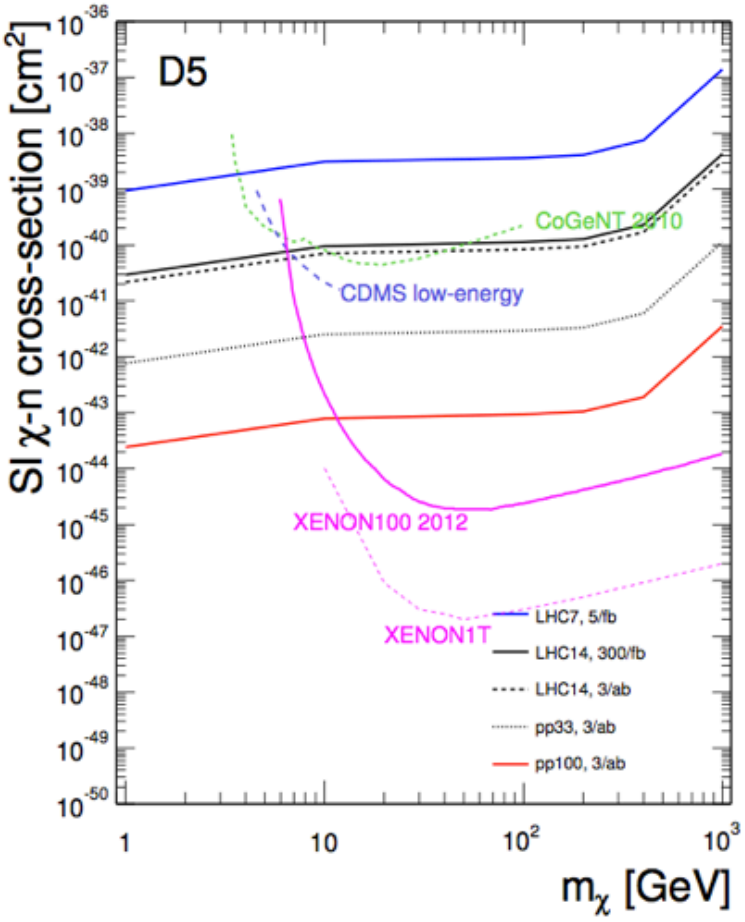
6. WIMPs via jet+MET

LHC14: Effective operators + Z′
300/fb

LHC14: Effective operators + Z′
3/ab

ILC: N/A

pp33: Effective operators + Z′



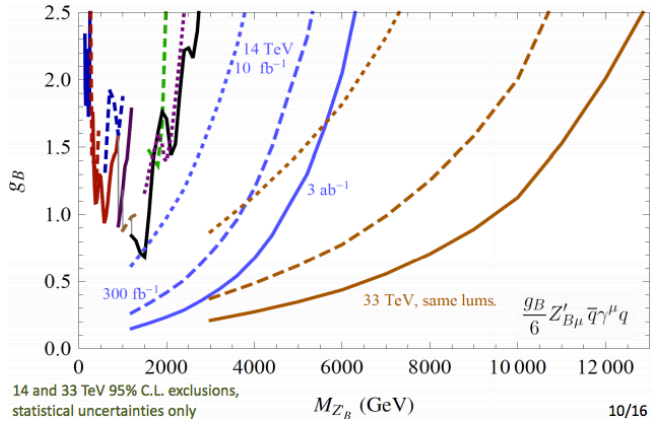
7. Heavy resonances

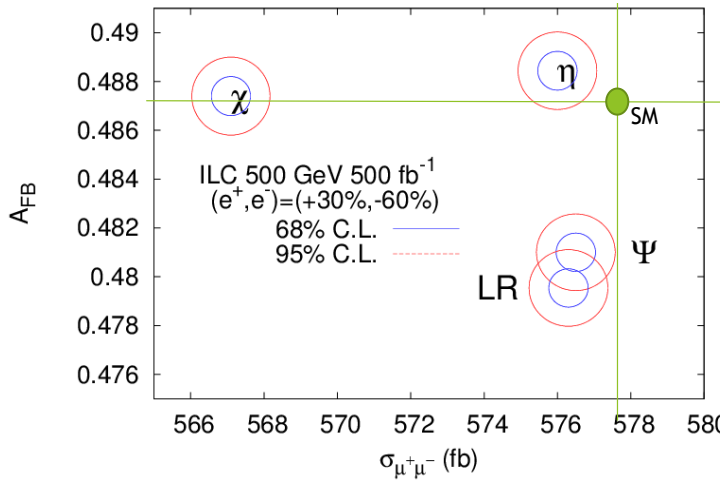
LHC14: X -> ll, jj, ttbar
300/fb

LHC14: X -> ll, jj, ttbar
3/ab

ILC: X->muons ILC whitepaper

pp33:X -> ll, jj, ttbar





8. Invisible Higgs

LHC14:
300/fb

LHC14:
3/ab

ILC:

pp33:

9. More Higgses

LHC14:
300/fb

LHC14:
3/ab

ILC:

pp33:

10. Heavy Quarks

LHC14: Single T->tH, maybe tZ studies
300/fb T T-> ll or l+j, BB-> ss leptons, T5/3

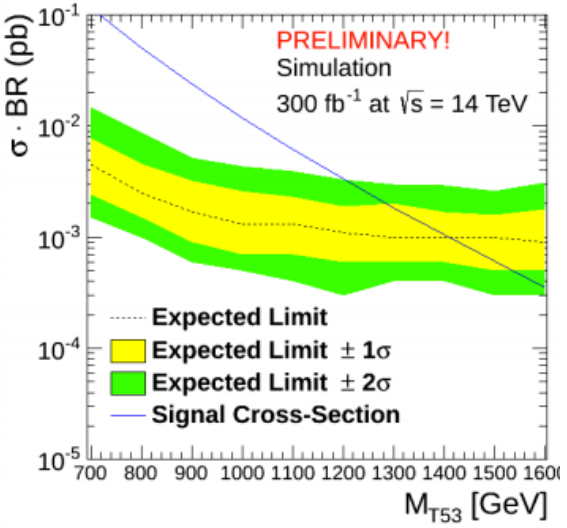
1-1.5 TeV

LHC14: Single T->tH, maybe tZ studies
3/ab T T->ll or l+j, BB-> ss leptons, T5/3

2-2.5 TeV

ILC: N/A

pp33: Single T->tH, maybe tZ studies
no T T->ll or l+j study
BB-> ss leptons, T5/3



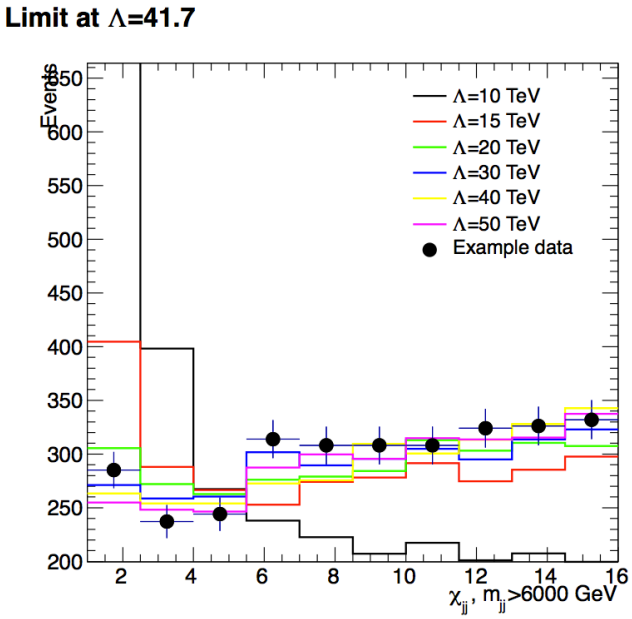
11. Compositeness

LHC14: quark via dijets, lepton via dileptons
300/fb

LHC14: quark via dijets, lepton via dileptons
3/ab

ILC: N/A

pp33:quark via dijets,



Conclusions

We are getting there.