WG3 session close up

N. Rompotis for the WG3 coordination

Contents

- Summary of the WG session presentations
- Summary of YR4 status
- Comments and discussion about WG3

Neutral MSSM

- Major additions:
  - Discussion on low tanβ scenarios
    - "hMSSM", low-tb-high and comparison with effective field theory predictions
  - Gluon fusion Higgs pT spectrum
- YR4 section is practically finished!
- Future plans:
  - Update the scenarios with the recommended SM parameters
  - New benchmarks

Charged Higgs

- Updated prediction with the SM parameters recommended by the LHC HXSG
- Dedicated study of the differential cross sections
  - Considerations about scale choice, 4FS vs 5FS, comparison of various observables
  - Recommendation for differential predictions
- YR4 status:
  - All information is available, just need to write up
- To be done after post-YR4
  - Charged Higgs in the intermediate mass region

Extended Scalars

NEW in this yellow report!

- Discussion includes:
  - 2HDM, Ewk Singlet, GM model (triplet) and short discussion on the available tools
- In addition to the usual CP-conserving 2HDM scenarios that have already been used in ATLAS/CMS new items:
  - Inert 2HDM, Fermiophobic, BGL, C2HDM
- Brand new section on singlets, including benchmark discussion
- Future plans:
  - Further organization of the benchmarks and study the overlap and the differences with Exotics/NMSSM subgroups

NMSSM

NEW in this yellow report!

- Effort to categorize and describe the main features of the available tools
  - Spectrum calculators (including decay widths); Vacuum stability
  - Production cross sections (includes suggestion for cross sections beyond gluon fusion and b-associated production)
- Signatures
  - Very first effort to organize NMSSM signatures and provide examples, including cross sections/BRs
- YR4 section is finished
- Future plans
  - Cascade study and other promising scenarios; what do we learn for many of these scenarios from the presence/absence of signals

Exotics

NEW in this yellow report!

- Group focuses on non-standard decays of h125
- Yellow report chapter considers
  - Example cross sections/BRs for benchmarks based on signatures
  - MC generation
  - Consideration of trigger, Higgs pT spectrum etc
- Future plans
  - Focus on feasibility studies, trigger strategy and sub-dominant decays

b-associated production

- Total cross sections
  - Updated recommendations; discussion of 4FS/5FS matching schemes; “ccH” cross section (NEW)
- MC generation
  - Comparison of tools; recommendation for tool setup and uncertainties; generator acceptance study
- YR4 status:
  - Last contributions will be available next week, then ready to finish the write up
- Future plans
  - Study masses other that 125 GeV; similar processes (e.g. bbZ); gluon fusion contribution

Concluding remarks

- YR4 status of WG3 chapters

Neutral MSSM	Done!
NMSSM	Done!
Extended scalars	Advanced (missing section)
Exotic Higgs decays	Advanced (needs clean up)
Charged Higgs	Advanced (all info available)
“bbH” *	Advanced

* not under WG3 review

- Many new chapters/topics under WG3
  - Need to put a lot of effort to understand what may be useful
  - Very challenging to organize the signatures and define useful benchmarks
  - Some signature overlap among Extended scalars/NMSSM/Exotics signatures, however, the starting point/motivation/considerations are different