

WHEPP-2015 WG1 (SM & BSM)

1) Overview of Run2 opportunities and challenges

- This can cover both experimental challenges and theory limitations: e.g. underlying events, pile-up issues, pdf uncertainties, etc.
- Perspective rather than just reiterating exclusion limits from Run1.

2) Higgs & Top as a tool to probe BSM physics at the LHC

Discussion oriented talks in WG (suggest to dedicate 1-2 hours every day to have a few overview but topical talks):

- Summarizing (>2 -3 sigma) excess seen in various searches of Run-I
- Non-SUSY searches at CMS/ATLAS
- Introduction to jet substructure tool and potential applications
- New ideas on DM models and its implications at LHC

Potential topics

1) Higgs physics & coupling measurements at LHC run II & ILC

- Can also include using Higgs as a tool for BSM searches

2) SUSY Searches

- Strong production i.e. gluinos, light flavor squarks: (a) kinematic variable for generic searches or tools to characterize a new particle if LHC sees one (b) compressed spectra scenarios using ISR tagging or using VBF topologies or otherwise.
- Targeted searches for 3rd generation i.e. stops, sbottoms, staus: scenarios not yet covered by experiments, any handles using angular distributions, SM higgs as a probe.

3) Top physics & BSM using top physics

- Measurement of top properties as a probe to BSM induced effects, e.g. spin polarization, spin correlations, etc.
- Precision measurements at ILC

4) Non-SUSY BSM: Composite Models, Extra dimension, Vector like quarks, extended gauge theories, heavy majorana neutrino.

5) BSM Models with DM candidates which can be tested at the LHC (correlation between direct searches & LHC)

- A lot of discussion going on in CMS and ATLAS about mono-X searches where X can be a jet / W / Z / top quark

6) Jet substructure tools and developments: Can be of common interest to 2,3 & 4 as a part of phase space in each of these deals with boosted objects and hence merged decay products.

7) Reinterpretation of current LHC searches

8) Heavy Higgs search at the LHC:

- Especially taking into account the interference effects

9) Higher order QCD calculations

- for vector bosons +jets, especially discussing the different ways in which QCD & EWK corrections can modify the Z+jets/photon+jets or W+jets/Z+jets ratios in a non-trivial way.