Natural SUSY MadAnalysis workshop - Grenoble (30 Sep - 4 Oct)

Notes by Suchita Kulkarni.
Workshop homage: https://lpsc.in2p3.fr/Indico/conferenceDisplay.py?confId=940

Analyses list discussed during workshop

EASY -- defined by Benjamin
GREEN - analyses to be read and discussed, CONF-NOTES on the indico page
Brackets in the following table indicate the number of the note

	ATLAS	CMS
0 lepton	6 - jets (ATLAS-CONF-2013-024)	alphaT8TeV (SUS-12-028) (ALREADY implemented in MadAnalysis with old framework, needs improvement)
	c jets (ATLAS-CONF-2013-068)	(SUS-12-024) EASY
	2b-jets (ATLAS-CONF-2013-053)	
	>= 3b-jets (ATLAS-CONF-2013-061) EASY	
1 lepton	+2b jets (ATLAS-CONF-2013-037) EASY	(SUS-13-011)(USING MT2 variable, might be tricky)
	>= 3b-jets (ATLAS-CONF-2013-061)	+ w/b-jets, all multiplicities (SUS-13-007) EASY
2 leptons	jets + MET (ATLAS-CONF-2013-048) (USING MT2 variable, might be tricky, there is a public code from Giacomo) http://www.hep.phy.cam.ac.uk/~lester/mt2/	(SUS-13-013)

Things to be obtained from experiments:
ATLAS:
Get the mistagging rate as a function of pT and eta from Sophio
Ask for a Les Houches file for benchmark points, we use the same MC generator and validate
Ask for digitized figure 4 from ATLAS-CONF-2013-037

CMS:

Make the table for trigger efficiencies as a function of pT publically available

Single lepton triggers:

electron: pT > 45 GeV epsilon: 85-97%; numbers for pT changed to reach the plateau of the efficiency, which has a strong pT dependence

For the Les Houches proceedings the following plans are envisaged:

For the proceedings:

Tools section (two proceedings):

Proceeding 1:

1. Merging (4 pages) (Authors: Nadja, Josselin, Benjamin)

Proceeding 2:

2. Building analyses database in MadAnalysis (10 pages) (Authors: May be all?)
   a. Sample implementation (3 pages)
   b. New Kinematic variables (2-3 pages)
   c. Interface between MadAnalysis and Delphes (1 page)
   d. Tuning (validation DELPHES including all the hacks) (3 pages)

BSM section: (one proceeding)

Proceeding 1:

1. Which analyses, validation (2-4 representative plots + comments on what works well and where agreement is less good) (3 pages)
   a. (can't understand the text here) describe what is needed from the experiments and the difficulties encountered in implementing the analyses
2. Interpretation of the results: (15 pages)
   a. Plots of
      i. Points excluded
      ii. Points not excluded (for each analysis + globally)
3. Comparison with SModelS

List of analyses to be implemented with priority:

1. CMS-SUS-12-028
2. ATLAS-CONF-2013-053
3. ATLAS-CONF-2013-037
4. CMS-SUS-13-011
5. ATLAS-CONF-2013-048

Prospective author list:

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