

Table of Contents

H ->	and $\mu\mu$ Process.....	1
	Goal of the group.....	1
	Group Contacts.....	1
	Group Members.....	1
	Plan of the Activity (both Higgs signals and SM backgrounds).....	1
	Common cuts definition between ATLAS and CMS.....	1
	Available Tools.....	2
	Results.....	2
	References.....	2
	Meetings.....	2
	Links.....	2

H -> and $\mu\mu$ Process

Goal of the group

Group Contacts

- Markus Schumacher (Freiburg), Alexander Nikitenko (Imperial College)

Group Members

- Experiment: Everybody who wants to contribute
- Theory: Everybody who wants to contribute

Plan of the Activity (both Higgs signals and SM backgrounds)

- differential K-factor: want to evaluate ratio of NLO cross-sections with and without experimental cuts and compare it with ratio given by MC generators using in analysis
- overview of background determination methods (data-driven, non-data driven)
 - ◆ QCD - using data OS/SS non-isol lepton-tau pairs and assuming OS/SS non-isol muon = OS/SS isol muon. Mass shape from data SS isol muon-tau pair.
 - ◆ W+jets - normalization on data W enriched area $MT(1+MET) > 40$ GeV and extrapolation into signal area from MC. Want to know uncertainty of extrapolation. Alternative: OS vs SS technique.
 - ◆ ttbar: tautau-->lelep: define control region by large jet multiplicity, need uncertainty on jet multiplicity distribution for signal and background; tautau-->lep had: opposite versus same sign
 - ◆ Z->tautau - using data Z->mumu events and replacing real muons with MC taus.
- list of LO/NLO Event Generators
 - ◆ VBF: currently HERWIG/PYTHIA, move to POWHEG and SHERPA, ALPGEN, MADEVENT family
 - ◆ Gluon Fusion: currently MC@NLO, check with POWHEG and SHERPA, ALPGEN, MADEVENT family
 - ◆ bH+X: currently PYTHIA, SHERPA, hoep for implementation in POWHEG
- wish List for theorists:
 - ◆ gg->H - implementation in POWHEG SUSY gg->H with t and b quarks in loop (Alessandro Vicini ?)
 - ◆ gg->bbH - implementation in POWHEG

Common cuts definition between ATLAS and CMS

- CMS cuts
 - ◆ SUSY H->2tau->l+jet inclusive: $p_{Tl} > 15$ GeV, $p_{T\tau} \text{ jet} > 20$ GeV, $DR(1-\tau) > 0.2$, $MT(1-MET) < 40$ GeV
 - ◆ SUSY H->2tau->l+jet with single b-tagging: at least one b-tagged jet $p_T > 30$ GeV, $\text{leta}_{-j1} < 2.4$
 - ◆ qq->qqH, H->2tau->l+jet: $p_{Tl} > 15$ GeV, $p_{T\tau} \text{ jet} > 30$ GeV, $DR(1-\tau) > 0.3$, $\text{eta}_{j1} \times \text{eta}_{j2} < 0$, $\text{leta}_{-j1} < 4.5$, $E_{t_j} > 30$ GeV, $M_{j1_j2} > 40$ GeV, $MT(\text{lepton}+MET) < 40$ GeV, jet veto:

no jet with $p_T \text{ raw} > 10 \text{ GeV}$ (corresponds to $p_T \sim 20 \text{ GeV}$ corrected) between tagging jets.

- ATLAS cuts:
 - ◆ SUSY H \rightarrow tau tau: 0 jet analysis (no jet above 20 GeV), light jet analysis (no b-tagged jet above 20 GeV), b-tagged analysis (at least one b-tagged jet with $p_T > 20 \text{ GeV}$) $p_{T,lep} > 15 \text{ GeV}$, $p_{T,tau} > 20 \text{ GeV}$, $DR(lep-lep,lep-tau) > 0.2$,
 - ◆ SUSY H \rightarrow mu mu (two branches (i) at least one b-tagged jet with $p_T > 20 \text{ GeV}$, (ii) no b-tagged jet)
 - ◇ 2 mu with $p_T > 15$ and $l_{\text{eta}} < 2.5$
 - ◇ missing transverse energy $MET < 40 \text{ GeV}$
 - ◇ (i) no b-jets with $p_T > 20$
 - ◇ (ii) $\cos \phi_{\mu\mu} < 0.65$, scalar sum $p_{T,jets} < 90 \text{ GeV}$

Available Tools

Results

References

Meetings

- CERN InDico Agenda [↗](#)

Links

-- ReiTanaka - 02-Oct-2010

This topic: LHCPHysics > LHCHWGTautau

Topic revision: r6 - 2014-11-04 - ReiTanaka



Copyright &© 2008-2021 by the contributing authors. All material on this collaboration platform is the property of the contributing authors.
or Ideas, requests, problems regarding TWiki? use Discourse or Send feedback