

This page collects the Run2 physics planning for the Jamboree discussion in November 2013.

Please create separate pages for specific detailed studies and keep this page as an "overview".

Agenda

indico link [↗](#)

Overview

With the discovery of the Higgs boson, the SM physics is almost complete. The most pressing question in the field is what is the next energy scale for physics beyond the SM. There are clear indications for the incompleteness of the SM, arising from both experimental observation and theoretical

- Dark matter
- Baryon number asymmetry needs additional source of CP violation
- Neutrino mass
- The hierarchy problem (naturalness), or Higgs mass stabilization

With these grand questions in mind, we would like to assess the potentials of the Run2 data, with the following general considerations,

- Explore advantage of the energy increase from 7 TeV to 13 TeV at the early start
- Develop a **agnostic** view of the new physics search, i.e. based on final states not on models
- Utilize optimally the existing efforts of Edinburgh group

Higgs properties

As the only scalar particle in the SM, the role of Higgs is quite unique and deserves a full examination.

Coupling measurements $HZZ \rightarrow 4l$

Coupling measurements in $H \rightarrow bb$

Latest HSG5 update [↗](#)

Latest VH, $H \rightarrow bb$ Prospects update [↗](#)

Total width measurements

Higgs self couplings in HH final states

- 14 TeV cross-section $gg \rightarrow HH(\rightarrow 1)$: 33.86 fb
- The promising channels are $gg \rightarrow HH(bb, WW \rightarrow 2l2n)$: BR ~ 1%
 - ◆ **With overall cross-section ~0.3fb, needs lots of data.**
- Practically it is like a WW analysis with 2 additional b-jets tagged as H
 - ◆ The final states are (2l, 2b, MET)
 - ◆ Could benefit from Corrinne/YY's expertise in WW channel

BSM Searches

Diboson final states

- Review of W' results - talk given at Majorana-to-LHC workshop at ICTP [↗](#)

VBF productions

SM measurements

VBF+V

ttV

-- YanyanGao - 31 Oct 2013

This topic: Main > AtlasEdinburghGroupRun2PhysicsPlanning

Topic revision: r8 - 2013-11-25 - WahidBhimji



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