



Contribution ID: 349

Type: parallel talk

## Heavy Scalar Search with Associated Production at 14TeV and 100TeV

*Tuesday 9 May 2017 17:45 (15 minutes)*

We present strategies to search for heavy scalars decaying to top quark pairs. The gluon fusion channel is unsatisfactory due to the interference effect with SM background. We propose to use heavy scalar production in association with one or two top quarks. In the framework of type II two Higgs doublet models at low  $\tan_\beta$  (heavy neutral Higgs mainly decaying to top quark pairs), we obtain current limits at the LHC using Run I data at 8TeV and show the potential sensitivity during Run II at 14 TeV. A detailed BDT study is performed for 14 TeV LHC and 100 TeV collider in the future.

### Summary

With the associated channel proposed, we find that for heavier neutral Higgs bosons the production in association with one top quark provides greater sensitivity than production in association with two top quarks. Current limits at the LHC using Run I data at 8 TeV and potential sensitivity for Run II at 14 TeV is shown. The sensitivity at LHC 14 TeV and 100 TeV future collider using BDT is also forecasted.

**Authors:** LIU, Tao (The Hong Kong University of Science and Technology); YINGYING, Li; HAJER, Jan (HKUST); ZHANG, HAO (University of California, Santa Barbara); CRAIG, Nathaniel (UC Santa Barbara)

**Presenter:** YINGYING, Li

**Session Classification:** Future Colliders