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## Event Selection and Signal Optimization of Three-Lepton and $b$ -jets Search in ATLAS

Wednesday, 27 June 2018 12:00 (20 minutes)

A study is performed to investigate the phenomenological signatures of additional scalar bosons at the LHC. This talk summarizes an overview of the ATLAS detector results for events observing excesses in multi-lepton events with three-leptons and at least two  $b$ -jets and number of jets, two and three. The channel investigated is that of  $A \rightarrow ZH[250] \rightarrow Z(\rightarrow \ell^\pm \ell^\mp) + hh, SS, Sh(\rightarrow b\bar{b}, VV)$ . The final state is a very clean signature with low expected background processes. In the CMS measurement of the cross section for top quark pair production in association with a  $W$  or  $Z$  boson in proton-proton collisions at 13 TeV, the production in three-lepton channels for the expected and the observed significances is found to be in excess of 5 standard deviations. This further enforces the high interest in performing multi-lepton with  $b$ -jet searches. The strategy of the event selection is described in this talk and leads to the signal optimization strategy.

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