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Search for the Standard Model Higgs boson in $H \rightarrow ZZ$ decay channels with the ATLAS detector

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The SM Higgs boson in the medium and high mass ranges has a large branching ratio for decays to a pair of neutral weak bosons. Three decay modes of the Z boson pair have been explored by ATLAS. One Z is typically produced on-shell, which can be tagged using leptonic decay products. The decay of the second $Z^{(*)}$ leads to three independent search channels: $llqq$, $ll\nu\nu$ and $llll$. Background compositions and topologies differ among these channels. The $llqq$ search can use jet information to reduce top and Z+jets backgrounds; the $ll\nu\nu$ search requires a good understanding of missing transverse energy, while the 4 lepton ('golden') channel is almost background-free and, owing to its low production rate, needs excellent lepton efficiencies in order to be sensitive.

This talk summarizes results in all three $H \rightarrow ZZ$ channels using data collected in 2011.

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