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Study of the decays of the Higgs boson to boson pairs at Run-II with the ATLAS experiment

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The Higgs boson plays an important role in the Standard Model: it provides mass to the elementary particles through the electroweak spontaneous symmetry breaking (EWSB). Discovered in 2012 by the ATLAS and CMS collaborations, today the Higgs boson is a very powerful tool to test the validity of SM theory at the TeV scale. The Higgs boson can be produced at proton-proton colliders, such as LHC, in different ways and many decay channels are predicted by the SM. At ATLAS Run-2, this particle is widely studied mainly through its decays in vectors boson pairs ($H \rightarrow ZZ$, $H \rightarrow WW$ and $H \rightarrow \gamma\gamma$). In this context, the latest results, obtained using the dataset collected by the ATLAS experiment during 2015 and 2016 at a center of mass energy of 13 TeV, are presented. Experimental techniques and estimate of the main backgrounds will be discussed in detail.

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