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Search for the Higgs boson decaying into b-quarks in the ATLAS experiment.

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In July 2012, the ATLAS and CMS experiments at the LHC reported the observation of a new particle with a mass about 125 GeV and properties consistent with that expected for the Higgs boson in the Standard Model. Especially, the SM Higgs boson decay channel $H \rightarrow b\bar{b}$ is predicted to have a branching ratio about 57% for $m_H = 125$ GeV. Hence, its observation is crucial in order to access to the Higgs boson's properties such as its overall decay width. The work I will perform during my PhD thesis shall focus on the search for the Higgs boson in associated production, i.e. emitted by a weak interaction gauge boson, in events containing 2 b-quarks and no lepton in the final state. The prospects for this search consists of the use of Boosted Decision Trees, which are efficient tools in order to take advantage of the correlation of final-state variables for signal events, and use these properties in order to discriminate $H \rightarrow b\bar{b}$ events from background events with similar final-states.

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