

MASTER THESIS PROJECTS @ IFAE ATLAS GROUP

TITLE: "Impact of High Granularity Timing Detectors in the Search for Standard Model Higgs produced in the Vector Boson Fusion mode and decaying into a pair of tau leptons"

PROJECT DESCRIPTION: The student will participate in the selection of events with a Standard Model Higgs boson produced in the Vector Boson Fusion mode and decaying into a pair of tau leptons. The channel will be used to assess the relevance of High Granularity Timing detectors in the Phase II upgrade of the Large Hadron Collider (LHC). It can also be used to study the trigger and possibly contribute to Technical Design Reports of the experiment. Finally, it can also allow quantify the impact of the upgraded inner detector in the Phase II of the LHC.

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TITLE: "Study of the performance of the online event selection in the ATLAS experiment"

PROJECT DESCRIPTION: The ATLAS experiment at CERN's Large Hadron Collider is recording proton-proton collision data at the energy frontier. Studies on the performance of the online event selection and on how to further improve it are of great interest in view of the expected instantaneous luminosity increase in 2018. These studies can have a significant impact on the physics capabilities of the experiment by increasing the selection efficiency for processes of interest like Supersymmetry or dark matter searches. Selected topological algorithms using information from muons, electrons, taus, jets or missing transverse energy will be studied. Data taken this year will be analysed to understand their current performance.

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