

Contribution ID: 155

Type: Poster

## Implementation of a kinematic fit algorithm in the search for Higgs boson pairs in the $b\bar{b}\gamma\gamma$ final state with the ATLAS detector

The observation of Higgs boson pairs is a fundamental step towards understanding the model of spontaneous electro-weak symmetry breaking as it represents the most direct method to estimate the cubic term of the Higgs boson potential, responsible for the tri-linear self-coupling of the boson ( $\lambda_{HHH}$ ). The poster will discuss the status and future perspectives of the search for such events produced at the LHC and detected with the ATLAS detector in the final state  $b\bar{b}\gamma\gamma$ , one of the most sensitive decay channels to the tri-linear coupling of the Higgs. Although the measurements of these couplings are still subject to significant statistical uncertainties, which will be reduced with the integration of the LHC Run 3 data in the near future, considerable progress has also been made in the development and optimization of methods aimed at increasing the sensitivity of the analysis. The presentation will focus particularly on one of these methods, namely, a kinematic fit algorithm designed to increase both signal reconstruction accuracy and background rejection power.

## Secondary track

Author:COLLABORATION, ATLASSession Classification:Poster T08

Track Classification: T08 - Higgs Physics