



SÉMINAIRE DE PHYSIQUE CORPUSCULAIRE

SUJET: Search for the Higgs boson produced in association with top quark pairs at 8 TeV with the ATLAS detector using the Matrix Element Method

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RÉSUMÉ:

After the discovery of a Higgs boson in bosonic decays, it is important to confirm this particle in fermionic decays in order to gain more confidence in the Standard Model (SM) Higgs boson hypothesis of the observation.

The production of the Higgs boson in association with a pair of top quarks (ttH), is one of the four main production mechanisms of the Higgs boson predicted by the SM.

Despite the fact that many searches for this production mechanism have been performed during Run I of the LHC, it has not yet been observed.

Such an observation would not only verify the coupling of the Higgs boson to fermions, but would also allow for the most direct determination of the top quark Yukawa coupling, which is an important parameter of the SM.

The presented search is designed for the b-quark pair decay mode of the Higgs boson and makes use the Matrix Element Method (MEM) to better distinguish the signal from its main and irreducible background tt+bb.

The MEM uses the theoretical description of a process in order to assign a probability weight to each observed event.

This probability reflects how likely it is that the observed event is consistent with a certain hypothesis.

Powerful discriminants can be constructed from the signal and background probabilities to significantly enhance the search sensitivity.

INFORMATION : <http://dpnc.unige.ch/seminaire/annonce.html>

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