

**Lundi 16/12/2019, 11h00**

CEA-Saclay Bât. 141, salle André Berthelot

---

## Probing extended Higgs and Dark Sectors with b-jets at the LHC

MATTHIAS SAIMPERT

CERN

---

In the Standard Model, Yukawa-like interactions are short-range interactions between the fermions and the Higgs boson. Even though these interactions have important macroscopic consequences, only a subset of them could be observed directly and their origin remains unclear.

At the LHC, the top and the b-quark are very sensitive probes for particles with Yukawa-like interactions, due to their large mass. This includes Higgs bosons, but also new scalar particles predicted by theories beyond the standard model and connected to the dark sector. By virtue of the  $t \rightarrow bW$  branching ratio being close to 100%, both b- and top quarks are inferred by the presence of hadronic jets initiated by b-quarks, called b-jets, in the final state.

I will introduce b-jet identification at the LHC and demonstrate its crucial role to study the coupling of the Higgs boson to third-generation fermions and probe the dark sector. I will highlight the importance of b-jet identification for the future steps of the LHC physics program and discuss the main experimental challenges.

---

Le café sera servi 10 minutes avant.

NB : La présentation d'une pièce d'identité est exigée à l'entrée du centre. Tous les auditeurs extérieurs sont priés de prévenir à l'avance Martine Oger, tél. 01 69 08 23 50, e-mail : [martine.oger@cea.fr](mailto:martine.oger@cea.fr).