



Laboratoire LEPRINCE-RINGUET
Ecole polytechnique IN2P3/CNRS

Séminaire

Exploring the Higgs boson self-coupling at the LHC

The discovery of the Higgs boson at the LHC has opened the study of the scalar sector of the standard model of particle physics, initiating a broad experimental programme of investigation with the ATLAS and CMS experiments. However, the Higgs scalar potential, that is at the origin of the mechanism of the spontaneous electroweak symmetry breaking, remains so far largely unknown. In particular its shape, that is directly related to the strength of the Higgs boson self-coupling, has not yet been measured. With deep implications on our understanding of Nature, the determination of this coupling is thus one of the main goals of the physics programme of the CMS and ATLAS Collaborations. The direct measurement of the self-coupling is possible via the study of Higgs boson pair production. Experimentally challenging because of the small cross section, the exploration of several decay channels and the usage sophisticated analysis techniques are required. The seminar will review the status of the LHC Run 2 analyses and present their latest results. Indirect measurements provide a complementary way to constrain the self-coupling from precision single Higgs boson measurements, and this possibility and the recent results will be presented. Finally, the prospects for future measurements of the self-coupling at the high-luminosity LHC and at possible future collider facilities will be described.

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Responsables séminaires

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