LHC Seminar

SPEAKER: Caterina Vernieri

TITLE: **First search for boosted Higgs boson production using the H->bb decay with CMS**

DATE: 20 Jun 2017, 11:00

PLACE: 40-S2-C01 - Salle Curie

ABSTRACT

An inclusive search for the standard model Higgs boson produced with high transverse momentum decaying to a bottom-antibottom quark pair has been performed using a data set of pp collisions at √s = 13 TeV collected with the CMS experiment at LHC. The data sample corresponds to an integrated luminosity of 35.9 fb−1. High-transverse-momentum Higgs bosons are reconstructed in a single jet with radius R = 0.8. Jet substructure and dedicated b-tagging techniques are used to identify boosted H → bb. The resulting experimental signature is a peak over a falling background in the distribution of the invariant mass of the jet. The Z process validates the analysis strategy and is observed with a local significance of 5.1 standard deviations for the first time in the single jet topology. An excess of events is observed above the expected background with a local significance of 1.3 standard deviations for a Higgs boson mass of 125 GeV. The signal strength corresponding to this excess, relative to that of the standard model Higgs boson, is μ = 2.17+1.44 when including Higgs pT spectrum corrections accounting for NLO and finite-top-mass effects.

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