LHC Seminar

SPEAKER: Loukas Gouskos

TITLE: **New jet taggers and algorithms as tools for SM and BSM physics at CMS**

DATE: 12 Nov 2019, 11:00

PLACE: 500/1-001 - Main Auditorium

ABSTRACT

Jet algorithms are at the heart of every measurement and search for physics beyond the standard model with quarks and gluons in the final state. Beyond classical jet algorithms used to estimate the momentum of hard quarks or gluons initiating a shower of hadrons, a large variety of jet techniques are used by CMS to identify the objects initiating jets. Through the study of jet constituent properties, jets originating from light quarks, heavy quarks, gluons, W/Z/Higgs bosons, top quarks and pileup interactions can be discriminated. First algorithms were developed and validated in LHC Run 1. Significantly more advanced techniques making use of machine learning have recently been introduced for analyzing the LHC Run 2 dataset. Among the most critical new event reconstruction techniques developed by CMS for LHC Run 2 are pileup mitigation tools. Pileup affects analyses with jets by introducing anomalous jets known as pileup jets and in real jets by modifying the shapes of jet observables, such as jet mass, jet momentum, and jet substructure observables. In addition, pileup can lead to a large degradation in the performance of missing transverse momentum and estimators for isolation of leptons. This talk will introduce recently developed jet identification and pileup mitigation tools and discuss recent results in Higgs physics and in searches for physics beyond the standard model making use of these new techniques.

Organised by: M. Mangano, M. Pepe-Altarelli, G. Unal.....
Refreshments will be served at 10h30