Contribution ID: **151** Type: **not specified**

SEARCHING FOR NEW HIGH MASS PHENOMENA DECAYING TO MUON PAIRS USING PROTON-PROTON COLLISIONS AT $\sqrt{s}$ = 13 TEV WITH THE ATLAS DETECTOR AT THE LHC

Tuesday 16 May 2017 15:40 (20 minutes)

The Standard Model (SM) of particle physics is a very successful predictive theory which explains the fundamental
interactions of elementary particles in the universe, except for gravity. However, the SM is known to be an effective
theory that is valid only in a low energy regime, called the elctroweak scale, and does not account for many observed
experimental results. For example, it does not offer a satisfying explanation for neutrino masses or dark matter. Hence,
it is clear that to fully understand and explain nature, a theoretical framework that goes beyond the Standard Model
(BSM) is required. While high mass resonances do not offer a complete solution to the problems mentioned above,
many BSM theories predict their existence. To name a few, extra dimensional models, grand unified theories, and
supersymmetric models all have the common goal of reconciling the very different scales of electroweak symmetry
breaking and high mass scales, and predict the existence of high mass resonances. Thus, finding high mass resonances
would help validate these theories, which do offer solutions to the aforementioned problems.
This analysis focuses on searching for new high mass phenomena using the latest data collected by the ATLAS detector at the LHC, which has an unprecedented centre-of-mass energy of 13 TeV and corresponds to 36.5 fb−1
at √s= 13 TeV. The search is conducted for both resonant and non-resonant new phenomena in dimuon final states. The
dimuon invariant mass spectrum is the discriminating variable used in this search. No significant deviations from the
Standard Model expectation are observed. Lower limits are set on the signal parameters of interest at 95% credibility
level, using a Bayesian interpretation.

Summary

Author: RETTIE, Sebastien (University of British Columbia (CA))

Presenter: RETTIE, Sebastien (University of British Columbia (CA))

Session Classification: Posters