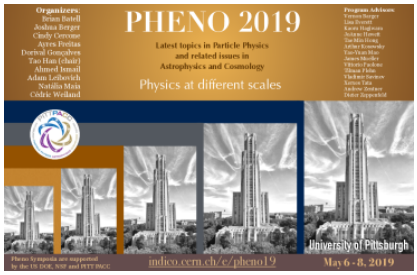

Contribution ID: **778** Type: **parallel talk**

Searching for New Dimuon Resonances at the LHC with CMS Open Data

Tuesday 7 May 2019 14:45 (15 minutes)

We study dimuon events in 2.11/fb of 7 TeV pp collisions, using CMS Open Data, and search for a narrow dimuon resonance with moderate mass (14-66 GeV) and substantial transverse momentum (pT). Applying dimuon pT cuts of 25 GeV and 60 GeV, we explore two overlapping samples: one with isolated muons, and one with prompt muons without an isolation requirement. Using the latter sample requires information about detector effects and QCD backgrounds, which we obtain directly from the CMS Open Data. We present model-independent limits on the product of cross section, branching fraction, acceptance, and efficiencies. These limits are stronger, relative to a corresponding inclusive search without a pT cut, by factors of as much as nine. Our "pT-enhanced" dimuon search strategy provides improved sensitivity to models in which a new particle is produced mainly in the decay of something heavier, as could occur, for example, in decays of the Higgs boson or of a TeV-scale top partner. An implementation of this method with the current 13 TeV data should improve the sensitivity to such signals further by roughly an order of magnitude.

Summary

LHC, Open Data

Authors: CESAROTTI, Cari (Harvard University); SOREQ, Yotam (Massachusetts Institute of Technology); THALER, Jesse (MIT); STRASSLER, Matthew (Rutgers University); XUE, Wei (CERN)

Presenter: CESAROTTI, Cari (Harvard University)

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