Contribution ID: **74** Type: **not specified**

Search for new particles decaying to top quark-antiquark pairs at CMS

Wednesday 13 December 2023 10:15 (15 minutes)

We present a model-independent search for new particles decaying to top quark-antiquark pairs ($t\bar{t}$) using 138 fb^{-1} of pp collision data at $\sqrt{s} = 13$ TeV recorded with the CMS detector during LHC Run 2. The search targets both resonant and non-resonant signatures in the spectrum of the invariant mass $m_{t\bar{t}}$.

Focusing on lepton+jets final states, we use novel top-tagging techniques to identify the hadronic decay of highly Lorentz-boosted top quarks. We further employ a deep neural network for event classification. Reconstructed $m_{t\bar{t}}$-distributions are used to derive constraints on various physics models predicting new particles decaying to $t\bar{t}$, such as heavy resonances, Kaluza-Klein gluons, heavy Higgs bosons (including interference with the SM process), as well as non-resonant axion-like particles, extending the reach of earlier searches significantly.

Primary author: JABUSCH, Henrik (UNI/EXP (Uni Hamburg, Institut fur Experimentalphysik))

Presenter: JABUSCH, Henrik (UNI/EXP (Uni Hamburg, Institut fur Experimentalphysik))

Session Classification: Searches Parallel

Track Classification: Parallels: Searches