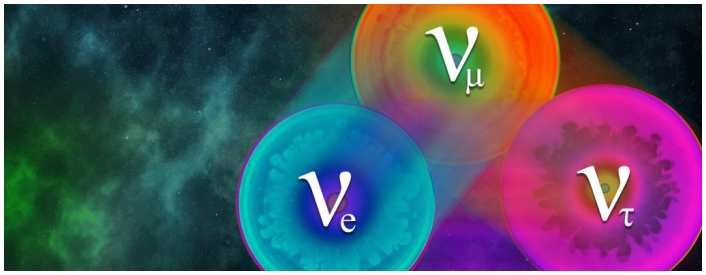

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Search for new physics in CMS open data and future colliders

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Abstract: We examine the angular distribution of both low and high-mass dimuon pairs using the open data from CMS, and with simulated electron-positron collisions from the proposed International Linear Collider (ILC). This collider operates at a center-of-mass energy of 500 GeV and is designed with an integrated luminosity of 4 ab(ˆ{-1}). Our main focus revolves around the cos(\theta_{\text{CS}}) variable, which is defined in the Collins-Soper frame. In the Standard Model, the production of dimuon pairs primarily occurs through the Drell-Yan process, which displays a notable forward-backward asymmetry. However, alternative scenarios extending beyond the Standard Model propose different shapes for the cos(\theta_{\text{CS}}) distribution. This angular distribution has substantial potential to distinguish among these various models, especially if we detect any excesses that exceed the predictions of the Standard Model.

Author: ELGAMMAL, Sherif (CTP, British University in Egypt (EG))

Presenter: ELGAMMAL, Sherif (CTP, British University in Egypt (EG))