Contribution ID: **19** Type: **Presentation**

Autoencoders for semivisible jet detection

Wednesday 17 August 2022 12:20 (15 minutes)

The production of dark matter particles from confining dark sectors may lead to many novel experimental signatures. Depending on the details of the theory, dark quark production in proton-proton collisions could result in semivisible jets of particles: collimated sprays of dark hadrons of which only some are detectable by particle collider experiments. The experimental signature is characterised by the presence of reconstructed missing momentum collinear with the visible components of the jets. This complex topology is sensitive to detector inefficiencies and mis-reconstruction that generate artificial missing momentum.

We propose a signal-agnostic strategy to reject ordinary jets and identify semivisible jets via anomaly detection techniques. A deep neural autoencoder network with jet substructure variables as input proves highly useful for analyzing anomalous jets. The study focuses on the semivisible jet signature; however, the technique can apply to any new physics model that predicts signatures with anomalous jets from non-SM particles.

Author: NIEDZIELA, Jeremi (ETH Zurich (CH))

Presenter: NIEDZIELA, Jeremi (ETH Zurich (CH))

Session Classification: Taggers