Contribution ID: **122** Type: **not specified**

Identifying semi-visible jets with darkCLR

Monday 6 November 2023 16:30 (15 minutes)

Abstract: Unsupervised machine learning enables us to utilize all available information within a jet to identify anomalies. Nevertheless, the network's need to acquire knowledge about the inherent symmetries within the raw data structure can hinder this process. Self-supervised contrastive learning representation offers a novel approach that preserves physical symmetries in the data while retaining the crucial discriminating features within the data based on fewer assumptions. We introduce darkCLR, a transformer-encoder network developed for self-upervised identifying of semi-visible jet. Finally, training a density-based NAE for representation evaluation resulted in improved performance metrics, including AUC and signal efficiency.

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Session Classification: Reconstruction & Representation Learning