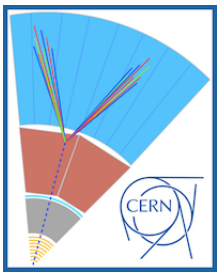

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Emerging Triggers: Creating a Safe Space for Dark Matter

Wednesday, 27 November 2019 17:30 (15 minutes)

The phenomenology of a dark SU(3) sector, within the context of a Hidden Valley, can lead to novel collider signatures. If accessible at the LHC, the dark quarks will shower throughout the detector volume, eventually fragmenting into jets of dark hadrons with a high multiplicity. The resulting unstable dark pions will decay back into visible hadrons, producing displaced tracks within a jet cone, termed *emerging jets*. These signals, although unique, are limited by the dedicated triggers used at collider experiments, potentially throwing away an interesting signal if not properly optimized. In this talk, I will consider *emerging jet* events with additional radiation, where lower mediator mass scales can be probed with higher trigger efficiencies. Outside of the dedicated trigger menu, collaborations are looking at new ways to exploit the information at trigger level. We attempt to forgo track reconstruction, and consider only hits on various layers of an ideal tracking detector. Using these low level variables, simple machine learning techniques can provide discriminating power between QCD backgrounds.

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