

Contribution ID: 380

Type: Poster

A search for emerging jets at 13 TeV with the ATLAS detector using the Run 2 dataset

A search is presented for emerging jets, novel detector objects that could be evidence of hidden or dark sectors with structures and symmetries similar to those in quantum chromodynamics (QCD). In some models of dark QCD, dark quarks undergo dark showering similar to QCD in the Standard Model (SM), leading to a high multiplicity of long-lived dark hadrons that subsequently decay to SM particles with varying displacements and mostly collimated with SM hadronic activity. Such activity yields jet-like detector objects but with multiple displaced vertices of varying displacements within the jet cone. Pair-production of a new scalar mediator that connects the dark sector with the SM and decays to a SM quark and a dark quark resulting in a four-jet final state of two QCD jets and two emerging jets. The search uses the full dataset of proton-proton collisions at center of mass energy of 13 TeV, collected by the ATLAS experiment at the LHC during Run 2 in 2015-2018. The area of dark QCD phase spaces probed by the analysis includes emerging jets produced in the inner detector from dark scalar mediators with masses between 600 and 2200 GeV and dark pions with proper lifetimes between 0.5 and 1000 mm.

Secondary track

Author: COLLABORATION, ATLAS Session Classification: T09

Track Classification: T09 - Beyond the Standard Model