



Contribution ID: 6

Type: Poster

Search for long-lived particles decaying into displaced hadronic jets in the ATLAS Calorimeter

Tuesday 13 August 2019 18:27 (3 minutes)

Based on a benchmark Hidden Sector model, this analysis explores the possibility of new physics being present at the LHC through long-lived particles. Given that the lifetime of these particles is mostly unconstrained, this raises the possibility of these particles decaying before they leave ATLAS detector. The specific scenario of two of these long-lived particles decaying to standard model particles in the ATLAS calorimeters is considered, leading to non-standard analysis methods being used to reconstruct this signature. This talk will describe the work that goes into designing complex signature-driven techniques and machine learning algorithms to take advantage of this promising signature, and a search for these long-lived particles at $\sqrt{s} = 13$ TeV, using either 10.8 fb^{-1} or 33.0 fb^{-1} of data depending on trigger, at the ATLAS experiment will be discussed.

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Session Classification: Poster pitch