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Search for long-lived neutral particles in pp collisions at $\sqrt{s} = 13$ TeV that decay into displaced hadronic jets in the ATLAS calorimeter

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Many extensions of the Standard Model predict the existence of long-lived particles leading to highly unconventional experimental signatures for which standard searches are not sensitive. In this poster we present a search for pairs of neutral long-lived particles decaying hadronically and giving rise to displaced jets. This analysis considers benchmark hidden sector models of neutral long-lived scalars with masses between 5 GeV and 475 GeV pair-produced by decays of mediators with masses between 60 GeV and 1000 GeV. A deep neural network is used to predict whether candidate jets were produced by a long-lived particle decay, SM jets, or beam-induced background, and an adversarial training is applied to minimize the impact of Monte Carlo mismodeling. The analysis uses the full Run 2 (2015-2018) data collected in pp collisions at 13 TeV with the ATLAS detector at the Large Hadron Collider. No significant excess is observed, and upper limits are set for these signal models.

In-person participation

Yes

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