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Search for long-lived particles decaying into displaced jets in proton-proton collisions at root s=13 TeV

By: [Sirunyan, AM](#) (Sirunyan, A. M.)^[1]; [Tumasyan, A](#) (Tumasyan, A.)^[1]; [Adam, W](#) (Adam, W.)^[2]; [Ambrogio, F](#) (Ambrogio, F.)^[2]; [Asilar, E](#) (Asilar, E.)^[2]; [Bergauer, T](#) (Bergauer, T.)^[2]; [Brandstetter, J](#) (Brandstetter, J.)^[2]; [Dragicevic, M](#) (Dragicevic, M.)^[2]; [Ero, J](#) (Ero, J.)^[2]; [Del Valle, AE](#) (Del Valle, A. Escalante)^[2] ...[More](#)

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Abstract

A search for long-lived particles decaying into jets is presented. Data were collected with the CMS detector at the LHC from proton-proton collisions at a center-of-mass energy of 13 TeV in 2016, corresponding to an integrated luminosity of 35.9 fb⁻¹. The search examines the distinctive topology of displaced tracks and secondary vertices. The selected events are found to be consistent with standard model predictions. For a simplified model in which long-lived neutral particles are pair produced and decay to two jets, pair production cross sections larger than 0.2 fb are excluded at 95% confidence level for a long-lived particle mass larger than 1000 GeV and proper decay lengths between 3 and 130 mm. Several supersymmetry models with gauge-mediated supersymmetry breaking or R-parity violation, where pair-produced long-lived gluinos or top squarks decay to several final-state topologies containing displaced jets, are also tested. For these models, in the mass ranges above 200 GeV, gluino masses up to 2300-2400 GeV and top squark masses up to 1350-1600 GeV are excluded for proper decay lengths approximately between 10 and 100 mm. These are the most restrictive limits to date on these models.

Keywords

KeyWords Plus: [GLUINO PRODUCTION](#); [SQUARK](#); [SUPERSYMMETRY](#); [HIGGS](#)

Author Information

Reprint Address: Sirunyan, AM (reprint author)

+ Yerevan Phys Inst, Yerevan, Armenia.

Addresses:

- + [1] Yerevan Phys Inst, Yerevan, Armenia
- [2] Inst Hochenergiephys, Vienna, Austria
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