Document details

Back to results | 1 of 1

Physical Review Letters
Volume 121, Issue 14, 5 October 2018, Article number 141802

Search for Pair-Produced Resonances Each Decaying into at Least Four Quarks in Proton - Proton Collisions at s = 13 TeV (Article) (Open Access)

Sirunyan, A.M.[a], Tumasyan, A.[a], Adam, W.[b], Ambrogi, F.[b], Asilar, E.[b], Bergauer, T.[b], Brandstetter, J.[b], Dragicevic, M.[b], Erö, J.[b], Escalante Del Valle, A.[b], Flechl, M.[b], Frühwirth, R.[b,gw], Ghete, V.M.[b], Hrubec, J.[b], Jeitler, M.[b,gw], Krammer, N.[b], Krätschmer, I.[b], Liko, D.[b], Madlener, T.[b], Mikulec, I.[b], Rad, N.[b],

View additional authors

[a]Yerevan Physics Institute, Yerevan, Armenia
[b]Institut für Hochenergiephysik, Wien, Austria
[c]Institute for Nuclear Problems, Minsk, Belarus

View additional affiliations

Abstract

View references (48)

This Letter presents the results of a search for pair-produced particles of masses above 100 GeV that each decay into at least four quarks. Using data collected by the CMS experiment at the LHC in 2015-2016, corresponding to an integrated luminosity of 38.2 fb-1, reconstructed particles are clustered into two large jets of similar mass, each consistent with four -parton substructure. No statistically significant excess of data over the background prediction is observed in the distribution of average jet mass. Pair-produced squarks with dominant hadronic R-parity-violating decays into four quarks and with masses between 0.10 and 0.72 TeV are excluded at 95% confidence level. Similarly, pair-produced gluinos that decay into five quarks are also excluded with masses between 0.10 and 1.41 TeV at 95% confidence level. These are the first constraints that have been placed on pair-produced particles with masses below 400 GeV that decay into four or five quarks, bridging a significant gap in the coverage of R-parity-violating supersymmetry parameter space.

SciVal Topic Prominence

Topic: supersymmetry | collisions | simplified models

Prominence percentile: 96.770

Indexed keywords

Engineering controlled terms: Elementary particles | Germanium compounds

Engineering uncontrolled terms: Background prediction | Confidence levels | Gluinos | Integrated luminosity | Parameter spaces | Proton proton collisions | Squarks

Engineering main heading: Tellurium compounds

Metrics

0 Citations in Scopus

0 Field-Weighted Citation Impact

PlumX Metrics

Usage, Captures, Mentions, Social Media and Citations beyond Scopus.

Cited by 0 documents

Inform me when this document is cited in Scopus:

Set citation alert >

Set citation feed >

Related research data

Search for pair-produced resonances each decaying into at least four quarks in proton-proton collisions at $\sqrt{s}=$ 13 TeV

Ovcharova, Ana , et al
Deutsches Elektronen-Synchrotron, DESY, Hamburg

Data linking provided by

Related documents

Search for R-parity violating supersymmetry in pp collisions at s=13TeV using b jets in a final state with a single lepton, many jets, and high sum of large-radius jet masses

Sirunyan, A.M. , Tumasyan, A. , Adam, W.

ISSN: 00319007
CODEN: PRLTA
Source Type: Journal
Original language: English

DOI: 10.1103/PhysRevLett.121.141802
PubMed ID: 30339442
Document Type: Article
Publisher: American Physical Society

References (48)

View in search results format >

All | Export | Print | E-mail | Save to PDF | Create bibliography

1 Witten, E.
Dynamical breaking of supersymmetry
(1981) *Nuclear Physics, Section B*, 188 (3), pp. 513-554. Cited 2927 times.
doi: 10.1016/0550-3213(81)90006-7
View at Publisher

2 Dimopoulos, S., Georgi, H.
Softly broken supersymmetry and SU(5)
(1981) *Nuclear Physics, Section B*, 193 (1), pp. 150-162. Cited 1725 times.
doi: 10.1016/0550-3213(81)90522-8
View at Publisher

3 Gol'Fand, Yu.A., Likhtman, E.P.
Extension of the algebra of Poincaré group generators and violation of P invariance
(1971) *JETP Lett.*, 13, p. 323. Cited 679 times.

4 Wess, J., Zumino, B.
Supergauge transformations in four dimensions
(1974) *Nuclear Physics, Section B*, 70 (1), pp. 39-50. Cited 1701 times.
doi: 10.1016/0550-3213(74)90355-1
View at Publisher

5 Nilles, H.P.
Supersymmetry, supergravity and particle physics
(1984) *Physics Reports*, 110 (1-2), pp. 1-162. Cited 3680 times.
doi: 10.1016/0370-1573(84)90008-5
View at Publisher

6 Barbieri, R., Ferrara, S., Savoy, C.A.
Gauge models with spontaneously broken local supersymmetry
(1982) *Physics Letters B*, 119 (4-6), pp. 343-347. Cited 1245 times.
doi: 10.1016/0370-2693(82)90685-2
View at Publisher

(2018) Physics Letters, Section B: Nuclear, Elementary Particle and High-Energy Physics

Search for pair-produced resonances decaying to quark pairs in proton-proton collisions at s =13 TeV
Sirunyan, A.M. , Tumasyan, A. , Adam, W.
(2018) Physical Review D

Search for new physics in events with two soft oppositely charged leptons and missing transverse momentum in proton–proton collisions at s=13TeV
Sirunyan, A.M. , Tumasyan, A. , Adam, W.
(2018) Physics Letters, Section B: Nuclear, Elementary Particle and High-Energy Physics

View all related documents based on references

Find more related documents in Scopus based on:

Authors > Keywords >