Inclusive Search for a Highly Boosted Higgs Boson Decaying to a Bottom Quark-Antiquark Pair

Abstract
An inclusive search for the standard model Higgs boson (H) produced in association with a lepton and decaying to a bottom quark-antiquark pair (b\overline{b}) is performed using a data set of pp collisions at \sqrt{s} = 13 TeV collected with the CMS experiment at the LHC. The data sample corresponds to an integrated luminosity of 39.3 fb^{-1}. A highly boosted, boosted Higgs boson decaying to b\overline{b} is considered to be a benchmark scenario in scenarios with a light Higgs boson.
Search for supersymmetry with Higgs boson to diphoton decays using the razor variables at $\sqrt{s} = 13$ TeV

The CMS Collaboration

A. M. Shyam, E. Tanaka

References

Citing articles (12)
ABSTRACT

Data from heavy ion collisions suggest that the evolution of a parton shower is modified by interactions with the color charges in the dense partonic medium created in these collisions, but it is not known how this evolution is affected by the interactions in the initial state.

The authors measured the splitting function in $pp$ and Pb-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV using the ATLAS detector at the LHC. They found that the splitting function is different in $pp$ and Pb-Pb collisions, indicating the presence of a medium-induced effect in Pb-Pb collisions.
Search for heavy resonances decaying to a top quark and a bottom quark in the lepton+jets final state in proton–proton collisions at 13 TeV
Measurement of normalized differential $t\bar{t}$ cross sections in the dilepton channel from pp collisions at $\sqrt{s} = 13$ TeV

**ABSTRACT**

Normalized differential cross sections for top quark pair production are measured in the dilepton ($e^+e^-$, $\mu^+\mu^-$, and $e^+\mu^-$) decay channels in proton-proton collisions at a center-of-mass energy of $\sqrt{s} = 13$ TeV. The CMS collaboration performed these measurements using data from the LHC. The results are compared to theoretical predictions and the implications for top quark properties are discussed.
Search for massive resonances decaying into WW, WZ, ZZ, qW, and qZ with dijet final states at \( \sqrt{s} = 13 \text{ TeV} \)

A.M. Shylov et al. (CMS Collaboration)

Phys. Rev. D 97, 072006 - Published 10 April 2018

ABSTRACT

Results are presented from a search in the dijet final state for new massive resonances decaying to pairs of W and Z bosons or a W/Z boson and a quark. Results are based on data recorded in proton-proton collisions at \( \sqrt{s} = 13 \text{ TeV} \) with the CMS detector at the CMS LHC. The
Nuclear modification factor of D^0 mesons in PbPb collisions at \( \sqrt{s_{NN}} = 5.02 \text{ TeV} \)

The CMS Collaboration

A. M. Shyue, A. Tumasyan


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University of Delhi, Delhi, India

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Zoltan K. Zsoldos
Search for resonant and nonresonant Higgs boson pair production in the $b\bar{b}t\bar{t}v\bar{v}$ final state in proton-proton collisions at $\sqrt{s} = 13$ TeV

Sahoo & S. K. Swain

Panjab University, Chandigarh, India

University of Delhi, Delhi, India
Ashok Kumar, Aashaq Shah, A. Bhardwaj, S. Chauhan, B. C. Choudhary, R. B. Garg, S. Keshri, A. Kumar, S. Malhotra, M. Naimuddin, K. Ranjan, R.
Measurement of Prompt $D^0$ Meson Azimuthal Anisotropy in Pb-Pb Collisions at $\sqrt{s_{NN}} = 5.02$ TeV

A. M. Sirunyan et al. (CMS Collaboration)
Phys. Rev. Lett. 120, 202301 – Published 16 May 2018

ABSTRACT

The prompt $D^0$ meson azimuthal anisotropy coefficients, $v_2$ and $v_3$, are measured at mid rapidity ($|y| < 0.5$) in Pb-Pb collisions at a center-of-mass energy $\sqrt{s_{NN}} = 5.02$ TeV per nucleon pair with data collected by the CMS experiment. The measurement is performed in the transverse momentum ($p_T$) range of 1 to 10 GeV/$c$, for central and midcentral collisions. The $v_2$ coefficient is found to be positive throughout the $p_T$ range studied. The first measurement of the prompt $D^0$ meson $v_3$ coefficient is performed, and values up to 0.07 are observed for $p_T$ around 4 GeV/$c$. Compared to measurements of charged particles, a similar $p_T$ dependence but smaller magnitude for $p_T < 6$ GeV/$c$, is found for prompt $D^0$ meson $v_2$ and in $v_3$ coefficients. The results are consistent with the presence of collective motion of chromoquarks at low $p_T$ and a path length dependence of charm quark energy loss at high $p_T$ thereby providing new constraints on the theoretical description of the interactions between charm quarks and the quark-gluon plasma.
Constraints on the chiral magnetic effect using charge-dependent azimuthal correlations in $p\bar{p}$ and PbPb collisions at the CERN Large Hadron Collider

Abstract
Charge-dependent azimuthal correlations of same- and opposite-sign pairs with respect to the second- and third-order event planes have been measured in $p\bar{p}$ collisions at $\sqrt{s} = 2.76$ TeV and PbPb collisions at $\sqrt{s_{NN}} = 2.76$ TeV.
Physics Letters B
Volume 771, 16 June 2018, Pages 674-680

Search for single production of a vector-like T quark decaying to a Z boson and a top quark in proton–proton collisions at \( \sqrt{s} = 13 \) TeV

The CMS Collaboration
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Institut für Höchstenergiephysik, Wien, Austria

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National Institute of Science Education and Research, Bhubaneswar, India


Punjab University, Chandigarh, India

Ashish Kumar, R. Prakash, A. Prakash, A. Chauhan, D.C. Chaudhary, R. B. Godg, E. Prasad, A. Kumar, S. Mehrotra, M. Natarajan, K. Khenjou, A. Sharma, V. Sharma

University of Delhi, Delhi, India


Saha Institute of Nuclear Physics, Kolkata, India
Observation of the Higgs boson decay to a pair of $\tau$ leptons with the CMS detector

Abstract
A measurement of the $H \rightarrow \tau \tau$ signal strength is performed using events
Search for the pair production of third-generation squarks with two-body decays to a bottom or charm quark and a neutralino in proton–proton collisions at \( \sqrt{s} = 13 \text{ TeV} \)

The CMS Collaboration

A.M. Bruni, A. Vranjes

Version: Physical Institute, Vanamara, Armenia

Citing articles (45)

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M. Bartl, P. Kota, Z.L. Tevendz, B. Ujviri

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Institute of Physics, University of Szeged, Szeged, Hungary


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IIT Guwahati, Guwahati, India


Indian Institute of Technology, Kharagpur, India


Indian Institute of Technology, Roorkee, India


University of Calcutta, Kolkata, India

K. Bhattacharya, K. Bhattacharya, K. Bhattacharya, K. Bhattacharya, K. Bhattacharya, K. Bhattacharya

Saha Institute of Nuclear Physics, Kolkata, India

http://linkinghub.elsevier.com/retrieve/pii/S0921452618300220
Search for Higgs boson pair production in events with two bottom quarks and two tau leptons in proton–proton collisions at $\sqrt{s} = 13$ TeV
Measurements of $\bar{t}t$ cross sections in association with $b$ jets and inclusive jets and their ratio using dilepton final states in pp collisions at $\sqrt{s} = 13$ TeV

The CMS Collaboration

Abstract

The CMS Collaboration has measured the $\bar{t}t$ cross section in association with $b$ jets and inclusive jets using dilepton final states in proton-proton (pp) collisions at $\sqrt{s} = 13$ TeV. The cross sections were measured in the fiducial kinematic regions and were obtained using a search for $W$ bosons with missing transverse energy. The measured cross sections are in agreement with the standard model predictions. The measured cross section ratio of $\bar{t}t$ to $t\bar{t}$ is consistent with the standard model prediction.
Exploration of fluorescent organotin compounds of α-amino acid Schiff bases for the detection of organophosphorous chemical warfare agents: quantification of diethylchlorophosphate†

Najot Singh, b Keshav Kumar, c Neha Srivastav, c Raghbir Singh, b Varinder Kaur, b Jerry P. Jasinski c and Ray J. Butcher d

Author affiliations

Abstract

Herein, fluorescent di-methyltin(IV) compounds (1–4) of an azomethinic ligating system derived from the template assisted condensation of α-amino acids (i.e. L-alanine, L-leucine, L-glutamine, and L-isoleucine) and 2-hydroxybenzaldehyde are reported. The synthesized di-methyltin derivatives were characterized using FT-IR spectroscopy, multi-nuclei NMR (1H, 13C and 119Sn) spectroscopy, mass spectrometry and single crystal X-ray diffraction. The compounds 1–4 exhibited fluorescence emission centred at 470 nm when excited at a wavelength of 380 nm. The emission band experienced quenching in the presence of various organophosphates, therefore, a representative compound was explored for the fluorogenic chemo-sensing of various organophosphates. The fluorescence response was found to be maximum for diethylchlorophosphate (a potential mimic of chemical warfare agents) and offered detection up to 0.023 mM. To explore the practicality of the test compound, it was successfully incorporated into portable devices of variable designs, such as fluorescent strips and silica tablets, for the on-the-spot detection of chemical warfare agents.
Search for top squarks and dark matter particles in opposite-charge dilepton final states at $\sqrt{s} = 13$ TeV

A. M. Schumay et al. (CMS Collaboration)

Phys. Rev. D 97, 012006 — Published 10 February 2018

ABSTRACT

A search for new physics in final states with two oppositely charged leptons or photons is presented.
Search for new physics in events with a leptonically decaying $Z$ boson and a large transverse momentum imbalance in proton–proton collisions at $\sqrt{s} = 13$ TeV

A. M. Sirunyan, A. Lukanov, L. CERN Collaboration

The European Physical Journal C, 78. Article number: 291 (2018) | Cite this article

Abstract

A search for new physics is carried out with a $Z$ boson produced in association with four leptons.

Indian Institute of Science (IISc), Bangalore, India
S. Chandhary & J. R. Komaragiri

National Institute of Science Education and Research, Bhubaneswar, India
S. Bisinapati, S. Bhattacharjee, B. Mandal, A. Nayak, D. K. Sahoo, N. Salooj & S. K. Swain

Panjab University, Chandigarh, India

University of Delhi, Delhi, India
A. Kumar, A. Shabia, S. Bhargavi, S. Chandra, B. C. Chandhary, R. B. Garg, S. Keshri, M. Kumar, C. Malhotra, M. Nairuddin, K. Rauj & R. Sharma

Saha Institute of Nuclear Physics, HSNR, Kolkata, India
Search for supersymmetry in proton-proton collisions at 13 TeV using identified top quarks

A. M. Sittam et al. (CMS Collaboration)

Phys. Rev. D 97, 012007 – Published 31 January 2018

Abstract

A search for supersymmetry is presented based on proton-proton collision events containing identified...
Physics Letters B
Volume 792, 10 May 2018, Pages 290-297

Measurement of quarkonium production cross sections in pp collisions at √s = 13 TeV

The CMS Collaboration

Abstract

1. Introduction
2. The CMS detector, data set, and event selection
3. Acceptance and efficiencies
4. Determination of the yields
5. Systematic uncertainties
6. Results
7. Summary

Keywords

Appendix A. Supersymmetry material

References

Citing articles (42)
Search for standard model production of four top quarks with same-sign and multilepton final states in proton–proton collisions at $\sqrt{s} = 13$ TeV

A. M. Sirunyan, A. Lankuzhanov, S. Chatrchyan

The European Physical Journal C, 78, Article number: 146 (2018) | Cite this article

Accessions: 29 Citations: 3 Attribution: Matrix

Abstract

A search for standard model production of four top quarks (tttτ) using 13 TeV proton-proton collisions recorded with the CMS detector at the LHC is presented. The data sample corresponds to an integrated luminosity of 36.1 fb$^{-1}$. The number of observed events is consistent with the prediction from background processes. No significant deviations from the standard model expectations are observed.
Pseudorapidity distributions of charged hadrons in proton-lead collisions at $\sqrt{s_{\text{NN}}} = 5.02$ and 8.16 TeV

The CMS collaboration: A. M. Sirunyan, J. M. Woods

*Journal of High Energy Physics, 2019, Article number: 45 (2019)*

**ABSTRACT**

The pseudorapidity distributions of charged hadrons in proton-lead collisions at nucleon-nucleon centre-of-mass energies $\sqrt{s_{\text{NN}}} = 5.02$ and 8.16 TeV are presented. The
Search for supersymmetry in events with at least three electrons or muons, jets, and missing transverse momentum in proton-proton collisions at $\sqrt{s} = 13$ TeV

Indian Institute of Science (IISc), Bangalore, India
S. Chandhury & J. R. Komaragiri

National Institute of Science Education and Research, Bhubaneswar, India
S. Bhowmik, R. Bhattacharya, V. Mandal, A. Nandy, D. K. Sahoo, N. Saloo & S. K. Swain

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University of Delhi, Delhi, India
A. Sinha, A. Majumdar, A. Bhardwaj, S. Choudhary, R. N. Garg, S. Kench, A. Kumar, S. Malhotra, M. Naik, K. Raina & R. Sharma

Saha Institute of Nuclear Physics, HRNL, Kolkata, India
Measurement of $b$ hadron lifetimes in pp collisions at $\sqrt{s} = 8$ TeV

Abstract

Indian Institute of Science (IISc), Bangalore, India
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Panjab University, Chandigarh, India
Kaur, R. Kumar, P. Kumar, A. Mehta, J. B. Singh & G. Weitz

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Keshri, A. Kumar, S. Mohanty, M. Naimuddin, K. Ranjan & R. Sharma

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R. Bhardwaj, R. Bhattacharya, S. Bhattacharya, U. Bhuvnesh, S. Dey, S. Dutt, S. Datta, S.
Ghosh, N. Majumdar, A. Modak, K. Mondal, S. Mukhopadhyay, S. Nandy, A. Purkait, A.
Roy, D. Roy, S. Roy Chowdhury, S. Sarkar, M. Sharan & S. Thakur
Measurement of differential cross sections in the kinematic angular variable $\phi^*$ for inclusive $Z$ boson production in pp collisions at $\sqrt{s} = 8$ TeV

Indian Institute of Science (IISc), Bangalore, India
S. Chandhary & J. R. Komaragiri

National Institute of Science Education and Research, Bhubaneswar, India

Punjab University, Chandigarh, India

University of Delhi, Delhi, India

Saha Institute of Nuclear Physics, HBNI, Kolkata, India
Pseudorapidity and transverse momentum dependence of flow harmonics in pPb and PbPb collisions

A. M. Sierow et al. (LHCb Collaboration)

Phys. Rev. C 99, 044902 — Published 15 October 2019

ABSTRACT

Measurements of azimuthal angular correlations are presented for high multiplicity PbPb collisions at

...
Physics Letters B
Volume 781, 1 June 2018, Pages 244-269

Search for a massive resonance decaying to a pair of Higgs bosons in the four b quark final state in proton–proton collisions at $\sqrt{s} = 13$ TeV

The CMS Collaboration, M. Aaboud, A. Ameri

Version: Preprint, 07 February 2018

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Discussion
Measurement of angular parameters from the decay $B^0 \rightarrow K^0 \mu^+ \mu^-$ in proton-proton collisions at $\sqrt{s} = 8$ TeV

The CMS Collaboration

Abstract

The CMS Collaboration presents results on the measurement of angular parameters from the decay $B^0 \rightarrow K^0 \mu^+ \mu^-$ in proton-proton collisions at $\sqrt{s} = 8$ TeV. The analysis is based on data collected by the CMS experiment at the LHC, corresponding to an integrated luminosity of 19.7 fb$^{-1}$ at a center-of-mass energy of 8 TeV. The angular distribution of the decay is studied using a fit to the decay kinematics and the results are compared with theoretical expectations. The study provides new constraints on the CKM matrix elements and is important for understanding the Cabibbo-Kobayashi-Maskawa (CKM) quark mixing.
Search for pair production of vector-like quarks in the $b\bar{W}b\bar{W}$ channel from proton–proton collisions at $\sqrt{s} = 13$ TeV

A.M. Skrinsky, A. Tamgopat

Abstract

Keywords

Introduction

1. Introduction

2. The CMS detector

3. Event selection

4. Data reconstruction

5. Event selection and mass reconstruction

6. Systematic uncertainties

7. Cross section and mass limits

8. Summary

Acknowledgments

References

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Search for pair production of vector-like quarks in the $b\bar{W}b\bar{W}$ channel from proton–proton collisions at $\sqrt{s} = 13$ TeV

A.M. Skrinsky, A. Tamgopat

Abstract

Keywords

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S. Bhardwaj, P. Hali, K. Mandal, A. Ray, S. Sekhar, S. Saha, S. Saha

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Search for pair production of vector-like quarks in the $b\bar{W}b\bar{W}$ channel from proton-proton collisions at $\sqrt{s} = 13$ TeV

A. M. Shabat, A. Tapaner

Abstract

Keywords

1. Introduction
2. The CMS detector
3. Event selection
4. Event reconstruction
5. Event selection and mass reconstruction
6. Systematics uncertainties
7. Cross section and mass limits
8. Summary

Acknowledgments

References

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Citing articles (74)
Search for supersymmetry in events with one lepton and multiple jets exploiting the angular correlation between the lepton and the missing transverse momentum in proton-proton collisions at \( \sqrt{s} = 13 \text{ TeV} \)

The CMS Collaboration*  
A.M. Sirunyan, A. Tumasyan

*Vernon Physical Institute, Yerevan, Armenia

Citing articles (10)
Search for new phenomena in final states with two opposite-charge, same-flavor leptons, jets, and missing transverse momentum in pp collisions at $\sqrt{s} = 13$ TeV

**ABSTRACT**

Search results are presented for physics beyond the standard model in final states with two opposite-charge, same-flavor leptons, jets, and missing transverse momentum. The data...
Observation of Correlated Azimuthal Anisotropy Fourier Harmonics in pp and p + Pb Collisions at the LHC

A. M. Sirunyan et al. (CMS Collaboration)

Phys. Rev. Lett. 122, 092301 — Published 26 February 2019

ABSTRACT

The azimuthal anisotropy Fourier coefficients $v_n$ in pp and p + Pb data are extracted via long-range two-parton correlations as a function of the event multiplicity and compared to corresponding results in pp and PbPb collisions. Using a Pythia Monte Carlo technique, $v_n$ correlations are measured for the first time in pp and p + Pb collisions. The $v_n$ and $v_{2n}$ coefficients are found to be positively correlated in all collision systems. For high multiplicity $p + Pb$ collisions, an anticorrelation of $v_2$ and $v_4$ is observed, with a similar correlation seen in pp and PbPb data at the same multiplicity. The new correlation results strengthen the case for a common origin of the collective flow in pp and $p + Pb$ collisions in the measured multiplicity range.
Measurements of the $pp \to ZZ$ production cross section and the $Z \to 4\ell$ branching fraction, and constraints on anomalous triple gauge couplings at $\sqrt{s} = 13$ TeV

M. Bartók, P. Raica, Z. L. Trocsanyi & B. Ujvari

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Ashok Kumar, AAshfaq Shab, A. Bhardwaj, S. Chauhan, B. C. Choudhary, R. B. Garg, S. Kishor, A. Kumar, S. Malhotra, M. Naimuddin, K. Ranjan & R. Sharma

Saha Institute of Nuclear Physics, IISN, Kolkata, India
Evidence for the Higgs boson decay to a bottom quark–antiquark pair

The CMS Collaboration

We report on a search for Higgs boson decays to b\(\bar{b}\) using data collected with the CMS detector at the LHC. The data sample corresponds to an integrated luminosity of 35.9 fb\(^{-1}\) at \(\sqrt{s} = 13\) TeV. The search is performed in the dilepton final state with two same-sign leptons and one additional lepton. The search is performed in multiple bins of dilepton mass and invariant mass of the same-sign leptons. The observed data are consistent with the standard model prediction. The 95% confidence level exclusion limits are set in the Higgs boson mass range 115-140 GeV/c\(^2\).
Observation of Electroweak Production of Same-Sign W Boson Pairs in the Two Jet and Two Same-Sign Lepton Final State in Proton-Proton Collisions at $\sqrt{s} = 13$ TeV

A. M. Sirunyan et al. (CMS Collaboration)
Phys. Rev. Lett. 120, 081801 – Published 22 February 2018

ABSTRACT

The first observation of electroweak production of same-sign W boson pairs in proton-proton collisions is reported. The data sample corresponds to an integrated luminosity of 83.7 $fb^{-1}$ collected at a center-of-mass energy of 13 TeV with the CMS detector at the LHC. Events are selected by requiring
Identification of heavy-flavour jets with the CMS detector in pp collisions at 13 TeV


Institute of Nuclear Physics, Krakow, Poland

Abstract

The paper presents the results of the identification of heavy-flavour jets using the CMS detector in pp collisions at 13 TeV. The analysis is based on a sample of 100 events. The jet identification is performed using the anti-kt algorithm with a radius parameter of 0.4. The performance of the CMS jet algorithm in the high-multiplicity environment is evaluated.

References

Search for lepton flavour violating decays of the Higgs boson to $\mu$ and $e$ in proton-proton collisions at $\sqrt{s} = 13$ TeV

The CMS collaboration: A. M. Sargsyan & J. M. Woods

Journal of High Energy Physics 2018, Article number 1 (2018) | Cite this article

ABSTRACT

A search for lepton flavor violating decays of the Higgs boson in the $\mu$ and $e$ decay modes is presented. The search is based on a data set corresponding to an integrated luminosity of 33.9 fb$^{-1}$. The upper limit on the branching fraction of Higgs to $\mu^+\mu^-$ or $e^+e^-$ is $3.2 \times 10^{-8}$ at 95% confidence level.
Search for the $X(5568)$ State Decaying into $B_s^0 \pi^+$ in Proton-Proton Collisions at $\sqrt{s} = 8$ TeV

A. M. Sirunyan et al. (CMS Collaboration)
Phys. Rev. Lett. 120, 202005 – Published 18 May 2018

ABSTRACT

A search for resonance-like structures in the $B_s^0 \pi^+$ invariant mass spectrum is performed using proton-proton collision data collected by the CMS experiment at the LHC at $\sqrt{s} = 8$ TeV, corresponding to an integrated luminosity of 19.7 fb$^{-1}$. The 20 resonances are reconstructed in the decay $B_s^0 \rightarrow J/\psi \pi^0$, with $J/\psi \rightarrow \mu^+ \mu^-$. The $D_s^0$ invariant mass distribution shows no signals.
Azimuthal correlations for inclusive 2-jet, 3-jet, and 4-jet events in pp collisions at $\sqrt{s} = 13$ TeV

A. M. Sirunyan, A. Tumasyan, L. CMS Collaboration

Abstract

Azimuthal correlations between the two jets with the largest transverse momenta $p_T$ in inclusive 2-, 3-, and 4-jet events are presented for several regions of the leading jet $p_T$ up to 4 TeV. For 3- and 4-jet events, measurements of the minimum azimuthal angle between

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University of Delhi, Delhi, India

Saha Institute of Nuclear Physics, HBNI, Kolkata, India
Search for Zγ resonances using leptonic and hadronic final states in proton-proton collisions at $\sqrt{s} = 13$ TeV

J. Karamegi, M. Bartók, P. Raßen, Z. L. Trocanyi & B. Ujvari

Indian Institute of Science (IISc), Bangalore, India
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University of Delhi, Delhi, India
A. Bhardwaj, S. Chauhan, B. C. Chandhary, R. B. Garg, S. Keshri, A. Kumar, Ashok Kumar, S. Malhotra, N. Namadkini, K. Ranjana, Aashar Shah & R. Sharma

Saha Institute of Nuclear Physics, IIT, Kolkata, India
Physics Letters B
Volume 777, 18 April 2018, Pages 396-399

Measurement of the associated production of a single top quark and a Z boson in pp collisions at \( \sqrt{s} = 13 \) TeV

The CMS Collaboration*
A.M. Alihanski, A. Gauza

*Vrije Universiteit Brussel, Brussels, Belgium

Abstract

The CMS Collaboration reports the measurement of the associated production of a single top quark and a Z boson in pp collisions at \( \sqrt{s} = 13 \) TeV using data corresponding to an integrated luminosity of 3.2 fb\(^{-1}\). The cross section is measured to be \( 8.6 \pm 1.0 \) (stat) \( \pm 1.3 \) (syst) \( \pm 1.3 \) (lumi) pb, consistent with the SM prediction.

Keywords

Top quark; Z boson; Associated production; CMS experiment; pp collisions; \( \sqrt{s} = 13 \) TeV.

1 Introduction

2 The CMS Detector

3 Data Collection, Reconstruction, and Identification

4 Simulation Studies

5 Event Selection, Signal and Background Control Regions

6 Shapes, channel analysis

7 Systematic Uncertainties

8 Results

9 Summary

Acknowledgments

Appendix A: Details of the top quark mass measurement with a W boson in \( p\bar{p} \) collisions at \( \sqrt{s} = 9 \) TeV

References

Appendix

Appendix B: Details of the top quark mass measurement with a W boson in \( p\bar{p} \) collisions at \( \sqrt{s} = 9 \) TeV

Citing articles (47)
Search for the flavor-changing neutral current interactions of the top quark and the Higgs boson which decays into a pair of $b$ quarks at $\sqrt{s} = 13$ TeV

The CMS collaboration: A. M. Szczurek (J. M. Woods)

Journal of High Energy Physics 2018, Article number 102 (2018) | Cite this article

409 Accesses | 21 Citations | 7 Altmetrics

ABSTRACT

A search for flavor-changing neutral currents (FCNC) in events with the top quark and the Higgs boson is presented. The Higgs boson decays to a pair of $b$ quarks is considered. The data

J. Kazaei, M. Bartlo, P. Reina, Z. L. Trochanjy & D. Ujvari

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Saha Institute of Nuclear Physics, USTN, Kolkata, India
Search for new physics in final states with an energetic jet or a hadronically decaying $W$ or $Z$ boson and transverse momentum imbalance at $\sqrt{s} = 13$ TeV

A. M. Shirman et al. (CDF Collaboration)
Phys. Rev. D 97, 092005; Published 21 May 2018

ABSTRACT
A search for new physics using events containing an imbalance in transverse momenta and one or more energetic jets arising from initial-state radiation or the hadronic decay of $W$ or $Z$ bosons is described. The data sample used in this search was collected during Run 2 of the CDF experiment at the Tevatron Collider and consists of 2.2 fb$^{-1}$ of p+p collisions at $\sqrt{s} = 13$ TeV. The analysis is performed in the dilepton channel without requiring the presence of an energetic jet and in the single-lepton channel with isolation requirements on the lepton. No excess in the data is observed compared to the background prediction, which is derived using a template method. The results are compared to several new-physics models and are used to set limits on various new-physics parameters. The results are also compared to previous CDF and D0 measurements.
Constraints on the double-parton scattering cross section from same-sign W boson pair production in proton-proton collisions at $\sqrt{s} = 8$ TeV

The CMS collaboration: A. M. Sirunyan & J. M. Woods

Journal of High Energy Physics 2015, Article number: 12 (2016) | Cite this article
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ABSTRACT

A first search for same-sign WW production via double-parton scattering is performed based on proton-proton collision data at a center-of-mass energy of 8 TeV using dimuon and...
Search for pair production of excited top quarks in the lepton + jets final state

Abstract
A search is performed for the pair production of spin-3/2 excited top quarks.
Study of jet quenching with isolated-photon-jet correlations in PbPb and pp collisions at $\sqrt{s_{NN}} = 5.02$ TeV

The CMS Collaboration
A. M. Shitan, A. Tumasyan

Institut f"ur Hochenergiephysik, Wien, Austria

Citing articles (29)
Search for new long-lived particles at \(\sqrt{s} = 13\) TeV

The CMS Collaboration

1. Introduction
2. Data sets and event samples
3. Event selection and inclusive cross-section of trigger
4. Background estimation
5. Systematic uncertainties
6. Results and interpretation
7. Conclusion

Acknowledgments

Appendix A: Supplementary material

References

Show full outline.
Search for gauge-mediated supersymmetry in events with at least one photon and missing transverse momentum in pp collisions at √s = 13 TeV
Search for excited quarks of light and heavy flavor in $\gamma + \text{jet}$ final states in proton-proton collisions at $\sqrt{s} = 13$ TeV

The CMS Collaboration

Abstract

Keywords

1. Introduction
2. The CMS detector
3. Event selection
4. Modeling signal and background
5. Systematic uncertainties
6. Results
7. Summary

Acknowledgments

References

Figures [6]

Citing articles (13)
Search for ZZ resonances in the 2\ell 2\nu final state in proton-proton collisions at 13 TeV

ABSTRACT

A search for heavy resonances decaying to a pair of Z bosons is performed using data collected with the CMS detector at the LHC. Events are selected by requiring two monojet charged...
Measurement of the underlying event activity in inclusive Z boson production in proton-proton collisions at $\sqrt{s} = 13$ TeV

The CMS collaboration: A. M. Smirnov, J. M. Woods

Journal of High Energy Physics 2016, Article number 32 (2016) | Cite this article

ABSTRACT

This measurement is of the underlying event activity in proton-proton collisions at $\sqrt{s} = 13$ TeV. The CMS experiment at the CERN LHC has made a measurement of the number of additional minimum bias hadronic interactions in the CMS acceptance. This provides an additional test of the perturbative QCD calculations and a probe of the non-perturbative dynamics of the strong interaction. The measurement is presented as a function of the total recorded luminosity and as a function of the number of minimum bias interactions in the same event. The results are compared with predictions from the PYTHIA and ALPGEN Monte Carlo event generators. The CMS experiment is able to measure the number of additional minimum bias interactions with a precision of 0.2% at $\sqrt{s} = 13$ TeV, which is an improvement of a factor of 2 over previous measurements.
Measurement of the inclusive $t\bar{t}$ cross section in pp collisions at $\sqrt{s} = 5.02$ TeV using final states with at least one charged lepton

The CMS collaboration, A. M. Strumia, E. N. Woods

Journal of High Energy Physics, 2018, Article number: 113 (2018) | Cite this article

ABSTRACT

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Panjab University, Chandigarh, India

University of Delhi, Delhi, India

Saha Institute of Nuclear Physics, HBNI, Kolkata, India
Measurement of the cross section for top quark pair production in association with a W or Z boson in proton-proton collisions at $\sqrt{s} = 13$ TeV

The CMS collaboration: A.M. Stupakiewicz & M. Woods

Journal of High Energy Physics 2013, Article number 11 (2014) | Cite this article

577 Accesses | 27 Citations | 3 Altmetric | Metrics

ABSTRACT

A measurement is performed of the cross section of top quark pair production in association with a W or Z boson in proton-proton collisions at $\sqrt{s} = 13$ TeV. The data sample of 3.2 fb$^{-1}$ was collected in 2011 and 2012 with the CMS detector at the Large Hadron Collider. The cross section for the production of a top quark pair in association with a W or Z boson is measured to be 0.59 ± 0.10 (stat) ± 0.08 (syst) pb. This result is compared to recent theoretical predictions. The measurements are also compared to data from other experiments. The results are consistent with the Standard Model predictions.
Measurement of associated $Z\gamma$ production in proton–proton collisions at $\sqrt{s} = 8$ TeV

A. M. Sitaraman, A. Tanman, L. Lumi Collaboration


Abstract

A study of the associated production of a $Z$ boson and a charm quark jet ($Z + c$), and a comparison to production with a hadronic jet ($Z + h$), in $pp$ collisions at a centre-of-mass energy of 8 TeV is presented.
Search for a heavy resonance decaying to a pair of vector bosons in the lepton plus merged jet final state at $\sqrt{s} = 13$ TeV

Abstract

A search for a new heavy particle decaying to a pair of vector bosons (WW or WZ) is presented using data from the CMS detector corresponding to an integrated luminosity of 35.9 fb$^{-1}$. 

J. Karanci, M. Bartłok, P. Raini, Z. L. Trocanyi & B. Ujvari

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Search for Narrow Resonances in the $b$-Tagged Dijet Mass Spectrum in Proton-Proton Collisions at $\sqrt{s} = 8$ TeV

A. M. Shyam on behalf of the CMS Collaboration
Phys. Rev. Lett. 120, 201801 (2018) – Published 14 May 2018

ABSTRACT

A search for narrow resonances decaying into bottom quark-antiquark pairs is presented, using a data sample of proton-proton collisions at $\sqrt{s} = 8$ TeV corresponding to an integrated luminosity of 8.7 fb$^{-1}$. The search is extended to masses lower than those reached in typical searches for resonances decaying into $b\bar{b}$ pairs at the LHC, by taking advantage of triggers that identify pairs...
Measurement of the $\Lambda_b$ polarization and angular parameters in $\Lambda_b \rightarrow J/\psi \Lambda$ decays from pp collisions at $\sqrt{s} = 7$ and 8 TeV

A. M. Scripnyj et al. (CMS Collaboration)
Phys. Rev. D 97, 072003 - Published 7 April 2018

ABSTRACT

An analysis of the bottom baryonic decay $\Lambda_b \rightarrow J/\psi \Lambda$ is performed to measure the $\Lambda_b$ polarization and three angular parameters in data from pp collisions at $\sqrt{s} = 7$ and 8 TeV, collected by the CMS experiment at the Large Hadron Collider. The $\Lambda_b$ polarization is measured to be $\lambda_{\Lambda_b} = -0.14 \pm 0.02 \pm 0.01 \pm 0.08$. The three angular parameters are determined to be $\cos\theta_{\Lambda_b} = 0.78 \pm 0.03 \pm 0.02$, $\phi_{\Lambda_b} = -0.12 \pm 0.03 \pm 0.02$, and $\phi_{\Lambda_{b\ell}} = 0.03 \pm 0.04 \pm 0.04$.
Search for Heavy Neutral Leptons in Events with Three Charged Leptons in Proton-Proton Collisions at $\sqrt{s} = 13$ TeV

A. M. Strumia et al. (CMS Collaboration)
Phys. Rev. Lett. 120, 221801 – Published 29 May 2018

ABSTRACT

A search for a heavy neutral lepton $N^0$ of Majorana nature decaying into a $\tau^-$ boson and a charged lepton is performed using the CMS detector at the LHC. The searched signature consists of three prompt charged leptons in any Flavor combination at electrons and muons. The data were collected in proton-proton collisions at a center-of-mass energy of 13 TeV with an integrated luminosity of 35.9 fb$^{-1}$. 

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Measurement of the inelastic proton-proton cross section at $\sqrt{s} = 13$ TeV

J. Kazanciö, M. Bartól, P. Raica, Z. L. Trocanyi & B. Ujvari

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Search for natural and split supersymmetry in proton-proton collisions at $\sqrt{s} = 13$ TeV in final states with jets and missing transverse momentum

The CMS collaboration: A. M. Sirunyan & J. M. Woods

526 Accesses | 32 Citations | 4 Altmetrics

ABSTRACT

A search for supersymmetry (SUSY) is performed in final states comprising one or more jets and missing transverse momentum using data from proton-proton collisions at a centre-of-mass energy of $\sqrt{s} = 13$ TeV in the year 2015. The analysis is performed in the high-mass region of the squark and gluino mass spectrum, and is sensitive to both natural and split supersymmetry. The signal region is defined by requiring at least three jets, with the presence of a jet identified as a b-jet, and at least one isolated lepton in the final state. The analysis uses a sampling-based approach with a conservative requirement on the $p_T$ of jets in the signal region. The observed data is compatible with the Standard Model expectations, and upper limits on cross sections are set for SUSY sparticle masses.
Search for single production of vector-like quarks decaying to a $b$ quark and a Higgs boson


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Saha Institute of Nuclear Physics, HBNI, Kolkata, India
Search for lepton-flavor violating decays of heavy resonances and quantum black holes to $\mu\nu$ final states in proton-proton collisions at $\sqrt{s} = 13$ TeV

**ABSTRACT**

A search is reported for heavy resonances decaying into $\mu\nu$ final states in proton-proton collisions recorded by the CMS experiment at the CERN LHC at $\sqrt{s} = 13$ TeV, corresponding...
Comparing transverse momentum balance of b jet pairs in pp and PbPb collisions at $\sqrt{s_{NN}} = 5.02$ TeV

The CMS Collaboration: A. M. Sirunyan, J. N. Woods


Abstract

The transverse momentum balance of pairs of back-to-back b quark jets in PbPb and pp collisions recorded with the CMS detector at the LHC is reported. The center of mass energy in both collision systems is 5.02 TeV per nucleon pair. Compared to the pp collision baseline, b
Search for dark matter in events with energetic, hadronically decaying top quarks and missing transverse momentum at $\sqrt{s} = 13$ TeV

J. Kazanci, M. Bartolí, P. Raice, Z. L. Trocsanyi & B. Ujvari

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Observation of Medium-Induced Modifications of Jet Fragmentation in Pb-Pb Collisions at \( \sqrt{s_{NN}} = 5.02 \) TeV Using Isolated Photon-Tagged Jets

A. M. Sirunyan et al. (CMS Collaboration)

Phys. Rev. Lett. 121, 242301 – Published 10 December 2018

ABSTRACT

Measurements of fragmentation functions for jets associated with an isolated photon are presented for the first time in pp and Pb-Pb collisions. The analyses use data collected with the CMS detector at the LHC at a nucleon-nucleon center-of-mass energy of \( \sqrt{s} = 7 \) TeV. Fragmentation functions are
Combined search for electroweak production of charginos and neutralinos in proton-proton collisions at $\sqrt{s} = 13$ TeV

**Abstract**

A statistical combination of several searches for the electroweak production of charginos and neutralinos is presented. All searches use proton-proton collision data at $\sqrt{s} = 13$ TeV.

**Authors**

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Measurement of the $Z/\gamma^* \rightarrow \tau\tau$ cross section in pp collisions at $\sqrt{s} = 13$ TeV and validation of $\tau$ lepton analysis techniques

Abstract

A measurement is presented of the $Z/\gamma^* \rightarrow \tau\tau$ cross section in pp collisions at $\sqrt{s} = 13$ TeV using data recorded by the CMS experiment at the LHC, corresponding to an
Search for new physics in events with two soft oppositely charged leptons and missing transverse momentum in proton–proton collisions at $\sqrt{s} = 13\text{ TeV}$

The CMS Collaboration


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Search for decays of stopped exotic long-lived particles produced in proton-proton collisions at $\sqrt{s} = 13$ TeV

The CMS collaboration A. M. Spanos, J. L. H. Woods

Journal of High Energy Physics 2018 Article number: 127 (2018) | Cite this article
546 Accesses | 0 Citations | 18 Altmetrics | Metadata

ABSTRACT

A search is presented for the decays of heavy exotic long-lived particles (LLPs) that are produced in proton-proton collisions at a center-of-mass energy of 13 TeV at the CERN LHC and come to rest in the CMS detector. Their decays would be visible during periods of time when the trigger for CMS is not active. Limits are set on the production cross-section for LLPs at various masses in the range of 10 GeV to 2 TeV. The results are also translated into lower limits on the mass of the LLPs below 10 TeV.

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Electroweak production of two jets in association with a Z boson in proton–proton collisions at \( \sqrt{s} = 13 \) TeV

A. M. Siugyan, A. Tamrazian, L. CMS Collaboration

The European Physical Journal C 78, Article number: 886 (2018) | cite this article

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Abstract

A measurement of the electroweak (EW) production of two jets in association with a Z boson in proton–proton collisions at \( \sqrt{s} = 13 \) TeV is presented, based on data recorded in 2016 by the CMS experiment at the LHC corresponding to an integrated luminosity of 35.9 fb\(^{-1}\). The measurements are performed using dijet mass distributions and dijet rapidity distributions. The dominant background is QCD multijet production, which is estimated from data using a shape-matching technique. The signal is recoiling against a Z boson and the background is subtracted using angular distributions of the jets with respect to the Z boson. The results are in agreement with the SM and are used to constrain the model parameters of new physics models. The results are compared with theoretical predictions and the agreement is found to be within the uncertainties of the predictions.
Search for R-parity violating supersymmetry in pp collisions at $\sqrt{s} = 13$ TeV using $b$ jets in a final state with a single lepton, many jets, and high sum of large-radius jet masses
Measurement of prompt and nonprompt charmonium suppression in PbPb collisions at 5.02 TeV

A. M. Sitaray, A. Panaraja, L. CMS Collaboration

The European Physical Journal C 76, Article number: 1009 (2016) | Cite this article
2020 Accesses 22 Citations 2 Altmetric | Metrics

Abstract

The nuclear modification factors of J/ψ and φ(2S) mesons are measured in PbPb collisions at a centre-of-mass energy per nucleon pair of √s_{NN} = 5.02 TeV. The analysis is based on PbPb and pp data samples collected by CMS at the LHC in 2015, corresponding to integrated luminosities of 25 nb⁻¹ and 340 pb⁻¹, respectively. The measurements are compared with predictions from different models.
Search for Physics Beyond the Standard Model in Events with High-Momentum Higgs Bosons and Missing Transverse Momentum in Proton-Proton Collisions at 13 TeV

A. M. Sirunyan et al. (CMS Collaboration)

Phys. Rev. Lett. 120, 211801 - Published 14 June 2018.

ABSTRACT

A search for physics beyond the standard model in events with one or more high-momentum Higgs bosons $H^*$ decaying to pairs of $b$ quarks, in association with missing transverse momentum is presented. The data, corresponding to an integrated luminosity of 35.9 fb$^{-1}$, were collected with the
Bose-Einstein correlations in pp, pPb, and PbPb collisions at \(\sqrt{s_N}\) = 0.9, 2.76, and 7 TeV.

A. M. Steinwender et al. (CMS Collaboration)

Phys. Rev. C 97, 064912 – Published 14 June 2018

ABSTRACT

Quantum-mechanical (coherence) transverse-momentum correlations are measured in pp collisions at \(\sqrt{s}\) = 0.9, 2.76, and 7 TeV, as well as in pPb and PbPb collisions at nucleus-nucleus center-of-mass energies of 0.92 and 2.76 TeV, respectively, using the CMS detector at the Large Hadron Collider.
Elliptic Flow of Charm and Strange Hadrons in High-Multiplicity \( p + Pb \) Collisions at \( \sqrt{s_{\text{NN}}} = 8.16 \) TeV

A. M. Sirunyan et al. (CMS Collaboration)
Phys. Rev. Lett. 121, 082301 – Published 21 August 2018

ABSTRACT
The elliptic azimuthal anisotropy coefficients \( h_2^{\text{ch}} \) and \( h_2^{\text{st}} \) are measured for charm (\( \Lambda_c \)) and strange (\( \Lambda \), \( \Xi \), \( \Omega \)) hadrons, using a data sample of \( p + Pb \)-collisions recorded by the CMS experiment at a nucleus-nucleus center-of-mass energy of \( \sqrt{s_{\text{NN}}} = 8.16 \) TeV. A significant positive signal from charm-range azimuthal correlations is observed for all particle species in high multiplicity \( p + Pb \) collisions.
Search for disappearing tracks as a signature of new long-lived particles in proton-proton collisions at $\sqrt{s} = 13$ TeV

Abstract

A search is presented for long-lived charged particles that decay within the CMS detector and produce the signature of a disappearing track. A disappearing track is an isolated track with
Measurement of differential cross sections for Z boson production in association with jets in proton-proton collisions at $\sqrt{s} = 13$ TeV

A. M. Sirunyan, A. L. Tumasyants, L. CMS Collaboration
The European Physical Journal C, 78, Article number: 595 (2018) | Cite this article
2844 Accesses | 13 Citations | 1 Altmetric | Matplotlib

Abstract

The production of a Z boson, decaying to two charged leptons, in association with jets in proton-proton collisions at a centre-of-mass energy of 13 TeV is measured. Data recorded...
Performance of the CMS muon detector and muon reconstruction with proton-proton collisions at $\sqrt{s} = 13$ TeV

A.M. Sirunyan1, A. Tumasyan1, W. Adam2, F. Ambrosi3, E. Asilar4, T. Bergmeier5, J. Brandreth-Bonow2, E. Bordalo2, M. Dragoun2, J. Eloy1 - on behalf of the CMS collaboration

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Measurements of Higgs boson properties in the diphoton decay channel in proton-proton collisions at $\sqrt{s} = 13$ TeV

The CMS collaboration: A. M. Sengupta & J. M. Woods

Journal of High Energy Physics 2013. Article number 365 (2013) | Cite this article

ABSTRACT

Measurements of Higgs boson properties in the $H \rightarrow \gamma\gamma$ decay channel are reported. The analysis is based on data collected by the CMS experiment in proton-proton collisions at $\sqrt{s} = 13$ TeV. The measurements are performed using the diphoton mass analysis.

J. Kazanci, M. Bartók, P. Reica, Z. L. Trocsanyi & B. Ujvari:

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Measurements of Higgs boson properties in the diphoton decay channel in proton-proton collisions at $\sqrt{s} = 13$ TeV.
PHYSICAL REVIEW LETTERS

Observation of $tt\bar{t}$ Production
A. M. Sirunyan et al. (CMS Collaboration)
Phys. Rev. Lett. 120, 221801 – Published 4 June 2018

Abstract
The observation of $tt\bar{t}$ boson production in association with a top quark-antiquark pair is reported, based on a combined analysis of proton-proton collision data at center-of-mass energies of $\sqrt{s} = 7$, 8, and 13 TeV, corresponding to integrated luminosities of 5.1, 19.7, and 36.1 $fb^{-1}$, respectively. The data were collected with the CMS detector at the LHC Run II. The results are statistically independent.
Search for a new scalar resonance decaying to a pair of Z bosons in proton-proton collisions at $\sqrt{s} = 13$ TeV

J. Karanci, M. Bartkó, P. Raics, Z. L. Trocsányi & B. Ujvári

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Saha Institute of Nuclear Physics, IIT, Kolkata, India
Search for a heavy right-handed W boson and a heavy neutrino in events with two same-flavor leptons and two jets at $\sqrt{s} = 13$ TeV

**Abstract**

A search for a heavy right-handed W boson (W_R) decaying to a heavy right-handed neutrino and a charged lepton in events with two same-flavor leptons (\(\ell^+\ell^-\)) and two jets is presented.

J. Kazanci, M. Bartók, P. Raica, Z. L. Trocsányi & B. Ujvari

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Search for high-mass resonances in final states with a lepton and missing transverse momentum at $\sqrt{s} = 13$ TeV

The CMS collaboration: A. M. Stranea [3], N. Woods

Journal of High Energy Physics 2018 Article number 129 (2018) | Click this article

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ABSTRACT

A search for new high mass resonances in proton-proton collisions having final states with an electron or muon and missing transverse momentum is presented. The analysis uses proton-proton collisions at a center-of-mass energy of 13 TeV recorded with the CMS detector at the LHC corresponding to an integrated luminosity of 39.3 fb$^{-1}$. The candidate states are searched in the mass region above 80 GeV. Candidate states are found in the mass region above 80 GeV. The observed significance of the signal is less than 5.3 standard deviations.

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Saha Institute of Nuclear Physics, HBNI, Kolkata, India
Search for a heavy resonance decaying into a Z boson and a Z or W boson in 2ℓνq final states at \( \sqrt{s} = 13 \) TeV

J. Kazanci, M. Bartók, P. Reina, Z. L. Trocsanyi & B. Ujvari

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Saha Institute of Nuclear Physics, IMSU, Kolkata, India
Measurement of differential cross sections for the production of top quark pairs end of additional jets in lepton + jets events from pp collisions at $\sqrt{s} = 13$ TeV

A. M. S. Collaboration (CMS Collaboration).

Phys. Rev. D 97, 112003 – Published to June 2018

ABSTRACT

Differential and double-differential cross sections for the production of top quark pairs in proton-proton collisions at $\sqrt{s} = 13$ TeV are measured as a function of kinematic variables of the top quarks and the lepton.
Search for new physics in dijet angular distributions using proton–proton collisions at $\sqrt{s} = 13\text{TeV}$ and constraints on dark matter and other models

A. M. Sirunyan, A. L. Langenfeld, J. / CMS Collaboration


Abstract

A search is presented for physics beyond the standard model, based on measurements of dijet angular distributions in proton–proton collisions at $\sqrt{s} = 13\text{TeV}$. The data collected with the CMS detector at the LHC consist of 35.9 $\text{fb}^{-1}$ of proton–proton collisions at $\sqrt{s} = 13\text{TeV}$.

In the fiducial phase-space region defined by $-0.3 < \Delta y < 1.5$, $|\cos \theta^*| < 0.9$, and $|\eta^*| < 2.5$, the angular distributions are measured for dijet systems with $p_T > 250\text{GeV}$.

The distributions are compared with theoretical predictions from the standard model and various new-physics models, including those with heavy vector-like quarks, supersymmetry, and dark matter.

The data are found to be consistent with the standard model predictions within the uncertainties.

The CMS Collaboration

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Saha Institute of Nuclear Physics, TIFR, Kolkata, India
Search for $t\bar{t}H$ production in the all-jet final state in proton-proton collisions at $\sqrt{s} = 13$ TeV

The CMS Collaboration, A. M. Sirunyan, T. M. Woods


ABSTRACT

A search is presented for the associated production of a Higgs boson with a top quark pair in the all-jet final state. Events containing seven or more jets are selected from a sample of proton-proton collisions at $\sqrt{s} = 13$ TeV collected with the CMS detector at the LHC in 2016.
Search for additional neutral MSSM Higgs bosons in the $\tau\tau$ final state in proton-proton collisions at $\sqrt{s} = 13$ TeV

A search is presented for additional neutral Higgs bosons in the $\tau\tau$ final state in proton-proton collisions at the LHC. The search is performed in the context of the minimal supersymmetric...
Search for high-mass resonances in dilepton final states in proton-proton collisions at $\sqrt{s} = 13$ TeV

J. Kazanci, M. Bartok, P. Raica, Z. L. Trocanyi & B. Ujvari:

Indian Institute of Science (IISc), Bangalore, India
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Evidence for associated production of a Higgs boson with a top quark pair in final states with electrons, muons, and hadronically decaying \( \tau \) leptons at \( \sqrt{s} = 13 \) TeV

The CMS collaboration: A. M. Strumia, L. N. Woods

Journal of High Energy Physics 2011 Article number 06 (2011) | Click this article

526 Accesses | 17 Citations | 5 Altmetric | Mexico

ABSTRACT

Results of a search for the standard model Higgs boson produced in association with a top quark pair in final states with electrons, muons, and hadronically decaying \( \tau \) leptons at \( \sqrt{s} = 13 \) TeV.
Observation of proton-tagged, central (semi)exclusive production of high-mass lepton pairs in pp collisions at 13 TeV with the CMS-TOTEM precision proton spectrometer

The CMS collaboration, A. M. Szymanski, T. J. Zielinski


700 Accesses | 17 Citations | 3 Altmetric | Metrics

Abstract

The process \( pp \rightarrow p^+ p^- \), with \( p^+ \) a muon or an electron pair produced at midrapidity with
Measurements of differential cross sections of top quark pair production as a function of kinematic event variables in proton-proton collisions at $\sqrt{s} = 13$ TeV

Abstract

Measurements of differential $t\bar{t}$ production cross sections are presented in the single-lepton decay channel, as a function of a number of kinematic event variables. The measurements are...
Search for a heavy resonance decaying into a Z boson and a vector boson in the $\nu\bar{\nu}q\bar{q}$ final state

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Jet properties in PbPb and pp collisions at \( \sqrt{s_{NN}} = 5.02 \text{ TeV} \)

The CMS collaboration: A. M. Santamaria, A. M. Woods

Journal of High Energy Physics 2018 Article number: 6 (2018) | Cite this article

SS5 Accessors | Cite this article

Abstract

Modifications of the properties of jets in PbPb collisions, relative to those in pp collisions, are studied at a nucleon-nucleon center-of-mass energy of \( \sqrt{s_{NN}} = 5.02 \text{ TeV} \) via correlations of charged particles with the jet axis in relative pseudorapidity (\( \Delta \eta \)), relative azimuth (\( \Delta \phi \)), and

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Search for dark matter produced in association with a Higgs boson decaying to $\gamma\gamma$ or $\tau^+\tau^-$ at $\sqrt{s} = 13$ TeV

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Observation of the $Z \rightarrow \phi \ell^+\ell^-$ Decay in $pp$ Collisions at $\sqrt{s} = 13$ TeV

A. M. Sirunyan et al. (CMS Collaboration)

Phys. Rev. Lett. 121, 141801 – Published 4 October 2018

ABSTRACT

This Letter presents the observation of the rare $Z$ boson decay $Z \rightarrow \phi \ell^+\ell^-$, where $\ell$ represents contributions from both $\ell = \mu$ and $\ell = e$. The $Z/\phi$ is a pair of electrons or muons, and the $\ell^+\ell^-$ is a pair of leptons of opposite charge. The analysis is based on a data sample of proton-proton collisions collected by the CMS Collaboration at the LHC at a center-of-mass energy of 13 TeV. The cross section is determined to be

...
Search for a singly produced third-generation scalar leptoquark decaying to a $\tau$ lepton and a bottom quark in proton-proton collisions at $\sqrt{s} = 13$ TeV

**Abstract**

A search is presented for a singly produced third generation scalar leptoquark decaying to a $\tau$ lepton and a bottom quark. Associated production of a leptoquark and a $\tau$ lepton is considered.
Search for resonant pair production of Higgs bosons decaying to bottom quark-antiquark pairs in proton-proton collisions at 13 TeV

The CMS collaboration, A.M. Brungs, I.I. N. Woods

Journal of High Energy Physics 2018, Article number: 152 (2018) | cite this article

ABSTRACT

A search for a narrow-width resonance decaying into two Higgs bosons, each decaying into a bottom quark-antiquark pair, is presented. The search is performed using proton-proton collisions at a center-of-mass energy of 13 TeV recorded by the CMS experiment at the LHC in 2015 and 2016 with an integrated luminosity of 35.9 and 32.1 fb⁻¹, respectively. Candidate events in the search are selected using a four-jet final state with at least two jets identified as bottom quarks. The mass of the resonant state is constrained to be above 10 TeV. The observed (expected) limits on the production cross section of the resonant state are 21 (8.6) fb at a mass of 10 TeV. The mass is constrained to be above 1 TeV for both the observed and expected limits.
PHYSICAL REVIEW LETTERS

Search for Pair-Produced Resonances Each Decaying into at Least Four Quarks in Proton-Proton Collisions at $\sqrt{s} = 13$ TeV

A. M. Shumygin et al. (CMS Collaboration)
Phys. Rev. Lett. 121, 141802 – Published 5 October 2018

ABSTRACT

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. Many data collected by the CMS experiment at the LHC in 2015–2016 corresponding to an integrated luminosity of 36.1 fb$^{-1}$, with tracks reconstructed in two large jets of similar mass, each consistent with four quark substructure. No statistically significant
Measurement of the weak mixing angle using the forward–backward asymmetry of Drell–Yan events in pp collisions at 8 TeV

A. M. Balkin, A. Tumasyan, L. CMS Collaboration
The European Physical Journal C 78, Article number: 701 (2018) | Link this article
3718 Accesses | 14 Citations | 1 Altmetric | Metrics

Abstract

A measurement is presented of the effective leptonic weak mixing angle ($\sin^2 \theta_W$) using the forward–backward asymmetry of Drell–Yan lepton pairs ($\mu\mu$ and $e^+e^-$) produced in proton–proton collisions at the Center of Mass Energy (CM energy) of 8 TeV. The data were collected by the CMS collaboration using its detector at the CERN Large Hadron Collider (LHC) between 2010 and 2012. The measurement is performed with two different methods, the Regge model and the perturbative QCD approach, which lead to a combined result of $\sin^2 \theta_W = 0.24 \pm 0.03$ (stat) $\pm 0.07$ (syst). This is the most precise measurement of $\sin^2 \theta_W$ to date.

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Search for narrow and broad dijet resonances in proton-proton collisions at $\sqrt{s} = 13$ TeV and constraints on dark matter mediators and other new particles

The CMS collaboration: A. M. Strauss, L. B. Woods

Journal of High Energy Physics 2019. Article number 120 (2019) | Click this article
645 Accesses | 33 Citations | 4 Altmetric | Monitor

ABSTRACT

Searches for resonances decaying into pairs of jets are performed using proton-proton collision data collected at $\sqrt{s} = 13$ TeV corresponding to an integrated luminosity of up to 36

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Angular analysis of the decay $B^+ \rightarrow K^+ \mu^+ \mu^-$ in proton-proton collisions at $\sqrt{s} = 8$ TeV

A. M. Sirunyan et al. (CMS Collaboration)

Phys. Rev. D 99, 112011 - Published 26 December 2018

ABSTRACT

The angular distribution of the flavor changing neutral current decay $B^+ \rightarrow K^+ \mu^+ \mu^-$ is studied in proton-proton collisions at a center-of-mass energy of 8 TeV. The analysis is based on data collected with the CMS detector at the LHC, corresponding to an integrated luminosity of 35.9 fb$^{-1}$. The forward-backward asymmetry in the $\mu^+ \mu^-$ system is measured to be $A_{FB} = (0.018 \pm 0.018 \pm 0.005) \%$, in agreement with the Standard Model prediction. The differential decay rate is measured as $\Gamma(B^+ \rightarrow K^+ \mu^+ \mu^-)/\Gamma(B^+) = (7.41 \pm 0.32 \pm 0.36) \times 10^{-8}$, in agreement with the SM expectation.
Search for beyond the standard model Higgs bosons decaying into a $\bar{b}b$ pair in pp collisions at $\sqrt{s} = 13$ TeV

**ABSTRACT**

A search for Higgs bosons that decay into a bottom quark-antiquark pair and are accompanied by at least one additional bottom quark is performed with the CMS detector. The data analyzed were recorded in proton-proton collisions at a centre-of-mass energy of $\sqrt{s} = 13$ TeV.

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Observation of the $\chi_{c0}(3P)$ and $\chi_{c2}(3P)$ and Measurement of their Masses

A. M. Strumia et al. (CMS Collaboration)

Phys. Rev. Lett. 123, 052002 – Published 20 August 2019

ABSTRACT

The $\chi_{c0}(3P)$ and $\chi_{c2}(3P)$ states are observed through their $Z(3900)$ decays, using an event sample of proton-proton collisions collected by the CMS experiment at the LHC. The data were collected at a center-of-mass energy of 13 TeV and correspond to an integrated luminosity of 10.7 fb$^{-1}$. The $Z(3900)$ mesons are identified through their dimuon decay channel, while the low-energy photons are
Constraints on models of scalar and vector leptoquarks decaying to a quark and a neutrino at \( \sqrt{s} = 13 \) TeV

A. M. Souvigny et al. (CMS Collaboration)
Phys. Rev. D 98 (2019) 012005 - Published 10 August 2018

ABSTRACT

The results of previous search by the CMS Collaboration for scalar and vector leptoquarks are interpreted to constrain models of leptoquark quark production. The search considers jets in association with a transverse momentum imbalance, using the \( M_{T2} \) variable. The analysis uses proton-proton collision data collected at a square root of the center-of-mass energy of 13 TeV in 2015-2018
Search for an exotic decay of the Higgs boson to a pair of light pseudoscalars in the final state with two $b$ quarks and two $\tau$ leptons in proton–proton collisions at $\sqrt{s} = 13$ TeV

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Measurement of the production cross section for single top quarks in association with W bosons in proton-proton collisions at $\sqrt{s} = 13$ TeV

The CMS collaboration: A. M. S. Stuparu, J. N. Woods.

Journal of High Energy Physics 2013, Article number 117 (2013) | Cite this article

ABSTRACT

A measurement is presented of the associated production of a single top quark and a W boson in proton-proton collisions at $\sqrt{s} = 13$ TeV by the CMS Collaboration at the CERN LHC. The

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Search for top squarks decaying via four-body or chargino-mediated modes in single-lepton final states in proton-proton collisions at $\sqrt{s} = 13$ TeV

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Search for black holes and sphalerons in high-multiplicity final states in proton-proton collisions at $\sqrt{s} = 13$ TeV

ABSTRACT

A search in energetic, high-multiplicity final states for evidence of physics beyond the standard model, such as black holes, string balls, and electroweak sphalerons, is presented. The data
Measurement of the groomed jet mass in PbPb and pp collisions at $\sqrt{s_{NN}} = 5.02$ TeV

**Abstract**

A measurement of the groomed jet mass in PbPb and pp collisions at a nucleon-nucleon center-of-mass energy of 5.02 TeV with the CMS detector at the LHC is presented. Jet grooming is a recursive procedure which sequentially removes soft constituents of a jet until a
Search for an exotic decay of the Higgs boson to a pair of light pseudoscalars in the final state of two muons and two τ leptons in proton-proton collisions at $\sqrt{s} = 13$ TeV

The DØ collaboration: A. M. Stripe and J. H. Woods

Journal of High Energy Physics 2013, Article number: 104 (2013) | Cite this article
455 Accesses | 6 Citations | 1 Altmetric | Metrics

ABSTRACT

A search for exotic Higgs boson decays to light pseudoscalars in the final state of two muons

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Search for vector-like T and B quark pairs in final states with leptons at $\sqrt{s} = 13$ TeV


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Constraining Gluon Distributions in Nuclei Using Dijets in Proton-Proton and Proton-Lead Collisions at $\sqrt{s_{NN}} = 5.02$ TeV

A. M. Stonyak et al. (CMS Collaboration)
Phys. Rev. Lett. 121, 052002 – Published 7 August 2018

ABSTRACT

The gluon density distributions in nuclei as functions of their average nucleon number $A^{1/n}$ are measured in proton-proton and proton-lead (pPb) collisions. The data samples were collected by the CMS experiment at the LHC at a nucleon-nucleon center-of-mass energy of 5.02 TeV.

The results are compared to the $p_T$ spectrum in dijets produced in all $A^{1/n}$ bin.

https://journals.aps.org/prl/abstract/10.1103/PhysRevLett.121.052002
Measurement of the top quark mass with lepton+jets final states using pp collisions at $\sqrt{s} = 13$ TeV

Abstract

The mass of the top quark is measured using a sample of $t\bar{t}$ events collected by the CMS detector using proton-proton collisions at $\sqrt{s} = 13$ TeV at the CERN LHC. Events are selected with one isolated muon or electron and at least four jets from data corresponding to 139 fb$^{-1}$ of integrated luminosity.

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Event shape variables measured using multijet final states in proton-proton collisions at $\sqrt{s} = 13$ TeV

The CMS collaboration. A. M. Strumia, L. N. Weeds

ABSTRACT

The study of global event shape variables can provide sensitive tests of predictions for multijet production in proton-proton collisions. This paper presents a study of several event shape variables calculated using jet four momenta in proton-proton collisions at a centre-of-mass energy of 13 TeV. The CMS Collaboration has made data available.

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ABSTRACT

Three of the most significant measured deviations from standard model predictions, the enhanced cross sections for $\ell+e^-\gamma$ in $\nu\bar{\nu}$ collisions, have been observed in $t\bar{t}$ production and the monochromatic signature of the photon can be explained by the enhanced rate of leptokquark decays with large couplings to third-generation quarks and mesons at the TeV scale. The existence of these states...
Studies of $B_{st}^0(5840)^0$ and $B_{st}(5830)^0$ mesons including the observation of the $B_{st}^0(5840)^0 \to B^0 K_S^0$ decay in proton-proton collisions at $\sqrt{s} = 8$ TeV

A. M. Svetitsky, A. Choudhary, L. E. N. Collaboration

The European Physical Journal C, 78, Article number: 999 (2018)

Abstract

Measurements of $B_{st}^0(5840)^0$ and $B_{st}(5830)^0$ mesons are performed using a data sample of proton-proton collisions corresponding to an integrated luminosity of $19.6 \text{ fb}^{-1}$ collected with

Studies of $B_{st}^0(5840)^0$ and $B_{st}(5830)^0$ mesons including the observation of the $B_{st}^0(5840)^0 \to B^0 K_S^0$ decay

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Performance of reconstruction and identification of $\tau$ leptons decaying to hadrons and $\nu_\tau$ in pp collisions at $\sqrt{s} = 13$ TeV

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Journal of Instrumentation, Volume 13, October 2018

Abstract

References
Search for physics beyond the standard model in high-mass diphoton events from proton-proton collisions at √s = 13 TeV

A. M. Square et al. (CMS Collaboration)

Phys. Rev. D 99, 092001 – Published 2 November 2018

ABSTRACT

A search for physics beyond the standard model is performed using a sample of high-mass diphoton events produced in proton-proton collisions at √s = 13 TeV. The data sample was collected in 2016 with the CMS detector at the LHC and corresponds to an integrated luminosity of 31.5 fb−1. The search exploits the diphoton signal and is performed in the dilepton and dijet mass spectra. No significant deviations from standard model expectations are observed.
Charged-particle nuclear modification factors in XeXe collisions at $\sqrt{s_{\text{NN}}} = 5.44$ TeV

The CMS collaboration: A. M. Sirunyan, I. I. N. Woods

Journal of High Energy Physics 2019, Article number: 130 (2019) | Cite this article

ABSTRACT
The differential yields of charged particles having pseudorapidity within $|\eta| < 1$ are measured using xenon xenon (XeXe) collisions at $\sqrt{s_{\text{NN}}} = 5.44$ TeV. The data, corresponding to an integrated luminosity of 3.42 ab$^{-1}$, were collected in 2017 by the CMS experiment at the LHC.

Charged-particle nuclear modification factors in XeXe collisions at $\sqrt{s_{\text{NN}}} = 5.44$ TeV

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Observation of Higgs Boson Decay to Bottom Quarks

A. M. Shukrani et al. (CMS Collaboration)

Phys. Rev. Lett. 121, 121801 – Published 17 September 2018

ABSTRACT

The observation of the standard model (SM) Higgs boson decay to a pair of bottom quarks is presented. The cross sections for this neutrino-like process were measured in association with a W or Z boson (WW, ZZ), and are consistent with the SM predictions within 1 or 2 standard deviations and are identified bottom quarks. The results from the measurement are

...
Measurement of jet substructure observables in $t\bar{t}$ events from proton-proton collisions at $\sqrt{s} = 13$ TeV

A. M. Sollfrank et al. [CMS Collaboration]

Phys. Rev. D 99, 092014 — Published 29 November 2018

ABSTRACT

A measurement of jet substructure observables is presented using $t\bar{t}$ events in the leptonic mode from proton-proton collisions at $\sqrt{s} = 13$ TeV recorded by the CMS experiment at the LHC, corresponding to an integrated luminosity of 8.3 fb$^{-1}$. Multiple jet substructure observables are measured to study the fragmentation, and fragmentation into the jets is measured to test the model predictions.
Search for a charged Higgs boson decaying to charm and bottom quarks in proton-proton collisions at $\sqrt{s} = 8$ TeV

The CMS collaboration: A. M. Stranahan & J. M. Woods

Journal of High Energy Physics 2013 Article number 115 (2013) | Cite this article

ABSTRACT

A search for charged Higgs boson decaying to a charm and a bottom quark ($H^+ \rightarrow c \bar{b}$) is performed using 19.7 fb$^{-1}$ of pp collision data at $\sqrt{s} = 8$ TeV. The production mechanism
Search for long-lived particles with displaced vertices in multijet events in proton-proton collisions at $\sqrt{s} = 13$ TeV

A. M. Souvigny et al. (CMS Collaboration)

Phys. Rev. D 99, 092011 – Published 16 November 2018

ABSTRACT

Searches are presented for a search for long-lived particles in proton-proton collisions at $\sqrt{s} = 13$ TeV, performed by the CMS LHC experiment. The data sample, which was recorded during 2015 and 2016, corresponds to an integrated luminosity of 3.5 fb$^{-1}$. This search uses a final state containing at least four isolated jets with associated missing transverse momentum, which is mainly due to the decays of long-lived particles with displaced vertices.
Search for pair-produced resonances decaying to quark pairs in proton-proton collisions at $\sqrt{s} = 13$ TeV

A. M. Soumyan et al. [CMS Collaboration]

Phys. Rev. D 98, 011104 - Published 28 December 2018

ABSTRACT

A general search for the pair productions of resonance, each decaying to two quarks, is reported. The search is conducted separately for neutral resonances (masses above 8 GeV), where each of the four final-state quarks generates a hadronic jet resulting in a two-jet signature, and for lighter resonances (masses below 8 GeV), where the jet signature resembles that of a single-particle resonance.

Issue

Vol. 98, no. 11, 1 December 2018
Evidence for the Associated Production of a Single Top Quark and a Photon in Proton-Proton Collisions at $\sqrt{s} = 13$ TeV

A. M. Stevenson et al. (CMS Collaboration)

Phys. Rev. Lett. 121, 221802 – Published 29 November 2018

ABSTRACT

The first evidence of events consistent with the production of a single top quark in association with a photon is reported. The analysis is based on proton-proton collisions at $\sqrt{s} = 13$ TeV and recorded by the CMS experiment in 2016, corresponding to an integrated luminosity of 83.2 fb$^{-1}$. Events are selected by requiring the presence of a single jet (j), a photon (\gamma), an imbalance in transverse momentum from an undetected neutrino (\nu), and at least two jets (j) at which exactly one is identified as associated with the hadronization of a $t$ quark. A multivariate discriminant based on topological and kinematic event properties is employed to separate signal from background processes. An excess above the background-only hypothesis is observed, with a significance of $4.4\sigma$. The fiducial cross section is measured for isolated photons with transverse momentum greater than 26 GeV in the central region of the detector. The measured cross section for the process and branching fraction to $t\gamma \rightarrow t\nu j$ is $43 \pm 9 \pm 5$ pb, which is consistent with the standard model prediction.
Search for resonances in the mass spectrum of muon pairs produced in association with b quark jets in proton-proton collisions at $\sqrt{s} = 8$ and 13 TeV

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Searches for pair production of charginos and top squarks in final states with two oppositely charged leptons in proton-proton collisions at $\sqrt{s} = 13$ TeV

The CMS collaboration: A. M. S. Strzbonski and J. M. Woods

Journal of High Energy Physics 2016 Article number 79 (2016) | Cite this article

ABSTRACT

A search for pair production of supersymmetric particles in events with two oppositely charged leptons (electrons or muons) and missing transverse momentum is reported. The data
Measurements of the differential jet cross section as a function of the jet mass in dijet events from proton-proton collisions at $\sqrt{s} = 13$ TeV

ABSTRACT

Measurements of the differential jet cross section are presented as a function of the jet mass in dijet events, in bins of jet transverse momentum, with and without a jet grooming algorithm.

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Precision measurement of the structure of the CMS inner tracking system using nuclear interactions

A.M. Strigari 1, A. Tumminia 1, W. Adam 1, F. Amberg 1, E. Anderle 1, T. Berggren 1, J. Manschotter 1, E. Baadeke 1, M. Dragisic 1, J. Melan 1, Published 26 October 2016. © 2016 IOP Publishing Limited for the benefit of the CMS collaboration.

Abstract


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Search for heavy resonances decaying into a vector boson and a Higgs boson in final states with charged leptons, neutrinos and b quarks at $\sqrt{s} = 13$ TeV

The CMS collaboration: A. M. Stranneke, J. M. Woods

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ABSTRACT

A search for heavy resonances, decaying into the standard model vector bosons and the standard model Higgs boson, is presented. The final states considered contain a b quark,
Search for supersymmetry in events with a $\tau$ lepton pair and missing transverse momentum in proton-proton collisions at $\sqrt{s} = 13$ TeV

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Measurement of charged particle spectra in minimum-bias events from proton–proton collisions at $\sqrt{s} = 13$ TeV

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Abstract

Pseudorapidity, transverse momentum, and multiplicity distributions are measured in the pseudorapidity range $|\eta| < 2.4$ for charged particles with transverse momenta satisfying $p_T > 200$ MeV/

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Search for the decay of a Higgs boson in the $\ell\ell\gamma$ channel in proton-proton collisions at $\sqrt{s} = 13$ TeV

The CMS collaboration, A. M. Sirunyan, L. N. Vodz

Journal of High Energy Physics, 2018, Article number: 152 (2018) | Click this article

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ABSTRACT

A search for a Higgs boson decaying into a pair of electrons or muons and a photon is described. Higgs boson decays to a Z boson and a photon ($H \rightarrow Z\gamma \rightarrow \ell\ell\gamma$), or to two photons, one of which has an internal conversion into a muon pair ($H \rightarrow \gamma'\gamma \rightarrow \mu\mu\gamma$), were considered. The analysis was performed with data collected at a center-of-mass energy of 13 TeV in 2016-2018, corresponding to an integrated luminosity of 37.3 fb$^{-1}$. No significant excess was observed.

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