

[< Back to results](#) | 1 of 1[Export](#) [Download](#) [Print](#) [E-mail](#) [Save to PDF](#) [Add to List](#) [More... >](#)[Full Text](#) [View at Publisher](#)Journal of High Energy Physics [Open Access](#)
Volume 2019, Issue 2, 1 February 2019, Article number 149

Measurements of $t\bar{t}$ differential cross sections in proton-proton collisions at $\sqrt{s}=13$ TeV using events containing two leptons (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,gv}, Ghete, V.M.^b, Hrubec, J.^b, Jeitler, M.^{b,gv}, Krammer, N.^b, Krätschmer, I.^b, Liko, D.^b, Madlener, T.^b, Mikulec, I.^b, Rad, N.^b,[View additional authors](#) ^aYerevan Physics Institute, Yerevan, Armenia^bInstitut für Hochenergiephysik, Wien, Austria^cInstitute for Nuclear Problems, Minsk, Belarus[View additional affiliations](#)

Abstract

[View references \(91\)](#)

Measurements of differential top quark pair $t\bar{t}$ cross sections using events produced in proton-proton collisions at a centre-of-mass energy of 13 TeV containing two oppositely charged leptons are presented. The data were recorded by the CMS experiment at the CERN LHC in 2016 and correspond to an integrated luminosity of 35.9 fb^{-1} . The differential cross sections are presented as functions of kinematic observables of the top quarks and their decay products, the $t\bar{t}$ system, and the total number of jets in the event. The differential cross sections are defined both with particle-level objects in a fiducial phase space close to that of the detector acceptance and with parton-level top quarks in the full phase space. All results are compared with standard model predictions from Monte Carlo simulations with next-to-leading-order (NLO) accuracy in quantum chromodynamics (QCD) at matrix-element level interfaced to parton-shower simulations. Where possible, parton-level results are compared to calculations with beyond-NLO precision in QCD. Significant disagreement is observed between data and all predictions for several observables. The measurements are used to constrain the top quark chromomagnetic dipole moment in an effective field theory framework at NLO in QCD and to extract $t\bar{t}$ and leptonic charge asymmetries. [Figure not available: see fulltext.]. © 2019, The Author(s).

SciVal Topic Prominence

Topic: jets | production | parton shower

Prominence percentile: 99.875

Author keywords

[Hadron-Hadron scattering \(experiments\)](#) [Top physics](#)

Funding details

Funding sponsor Funding number

Conselho Nacional de
Desenvolvimento
Científico e Tecnológico

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 documents

Measurements of differential
cross sections of top quark pair
production as a function of
kinematic event variables in
proton-proton collisions at $\sqrt{s}=13$
TeVSirunyan, A.M. , Tumasyan, A. ,
Adam, W.
(2018) *Journal of High Energy
Physics*Measurement of differential cross
sections for top quark pair
production using the lepton+jets
final state in proton-proton
collisions at 13 TeVKhachatryan, V. , Sirunyan, A.M. ,
Tumasyan, A.
(2017) *Physical Review D*Measurement of the top quark
mass with lepton+jets final states
using p p collisions at $\sqrt{s}=13$ TeVSirunyan, A.M. , Tumasyan, A. ,
Adam, W.
(2018) *European Physical Journal
C*[View all related documents based
on references](#)


Funding text #3

Individuals have received support from the Marie-Curie programme and the European Research Council and Horizon 2020 Grant, contract No. 675440 (European Union); the Leventis Foundation; the A.P. Sloan Foundation; the Alexander von Humboldt Foundation; the Belgian Federal Science Policy Office; the Fonds pour la Formation à la Recherche dans l'Industrie et dans l'Agriculture (FRIA-Belgium); the Agentschap voor Innovatie door Wetenschap en Technologie (IWT-Belgium); the F.R.S.-FNRS and FWO (Belgium) under the "Excellence of Science — EOS" — be.h project n. 30820817; the Ministry of Educa-

Funding text #4

tion, Youth and Sports (MEYS) of the Czech Republic; the Lendület ("Momentum") Programme and the János Bolyai Research Scholarship of the Hungarian Academy of Sciences, the New National Excellence Program ÚNKP, the NKFI research grants 123842, 123959, 124845, 124850 and 125105 (Hungary); the Council of Scientific and Industrial Research, India; the HOMING PLUS programme of the Foundation for Polish Science, cofinanced from European Union, Regional Development Fund, the Mobility Plus programme of the Ministry of Science and Higher Education, the National Science Center (Poland), contracts Harmonia 2014/14/M/ST2/00428, Opus 2014/13/B/ST2/02543, 2014/15/B/ST2/03998, and 2015/19/B/ST2/02861, Sonata-bis 2012/07/E/ST2/01406; the National Priorities Research Program by Qatar National Research Fund; the Programa de Excelencia María de Maeztu, and the Programa Severo Ochoa del Principado de Asturias; the Thalís and Aristeia programmes cofinanced by EU-ESF, and the Greek NSRF; the Rachadapisek ... View all 

Funding text #5

Also at Malaysian Nuclear Agency, MOSTI, Kajang, Malaysia Also at Consejo Nacional de Ciencia y Tecnología, Mexico City, Mexico Also at Warsaw University of Technology, Institute of Electronic Systems, Warsaw, Poland Also at Institute for Nuclear Research, Moscow, Russia Now at National Research Nuclear University 'Moscow Engineering Physics Institute' (MEPhI), Moscow, Russia Also at St. Petersburg State Polytechnical University, St. Petersburg, Russia Also at University of Florida, Gainesville, U.S.A. Also at P.N. Lebedev Physical Institute, Moscow, Russia Also at California Institute of Technology, Pasadena, U.S.A. Also at Budker Institute of Nuclear Physics, Novosibirsk, Russia Also at Faculty of Physics, University of Belgrade, Belgrade, Serbia Also at INFN Sezione di Pavia a, Università di Pavia b, Pavia, Italy Also at University of Belgrade, Faculty of Physics and Vinca Institute of Nuclear Sciences, Belgrade, Serbia Also at Scuola Normale e Sezione dell'INFN, Pisa, Italy Also at... View all 

ISSN: 11266708

Source Type: Journal

Original language: English

DOI: 10.1007/JHEP02(2019)149

Document Type: Article

Publisher: Springer Verlag

References (91)

[View in search results format >](#)

All Export Print E-mail Save to PDF Create bibliography

View all 91 references

- 1 Aad, G., Abajyan, T., Abbott, B., Abdallah, J., Khalek, S.A., Abdelalim, A.A., Abdinov, O., (...), Pinamonti, M. Measurements of top quark pair relative differential cross-sections with ATLAS in pp collisions at $\sqrt{s} = 7$ TeV ([Open Access](#))

(2013) *European Physical Journal C*, 73 (1), art. no. 2261. Cited 78 times.

<http://link.springer-ny.com/link/service/journals/10052/index.htm>

doi: 10.1140/epjc/s10052-012-2261-1

[View at Publisher](#)

- 2 The ATLAS collaboration, Aad, G., Abbott, B., Abdallah, J., Abdel Khalek, S., Abdinov, O., Aben, R., (...), Zwalinski, L. Measurement of the $t\bar{t}$ production cross-section as a function of jet multiplicity and jet transverse momentum in 7 TeV proton-proton collisions with the ATLAS detector ([Open Access](#))

(2015) *Journal of High Energy Physics*, 2015 (1), art. no. 20. Cited 17 times.

<http://link.springer.com/journal/13130>

doi: 10.1007/JHEP01(2015)020

[View at Publisher](#)