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Search for dark matter produced in association with a single top quark or a top quark pair in proton-proton collisions at √s=13 TeV (Article) (Open Access)

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Roeck, A., Deelen, N., Dobson, M., Dünser, M., Dupont, N., Elliott-Peisert, A., Everaerts, P., Fallavollita, F., Fasanella, D., Franzoni, G., Fulcher, J., Funk, W., Gigi, D., Gilbert, A., Gill, K., Glege, F., Gruchala, M., Guilbaud, M., Gulhan, D., Hegeman, J., Heidegger, C., Innocente, V., Jafari, A., Janot, P., Karacheban, O., Kieseler, J., Kornmayer, A., Krammer, M., Lange, C., Lecoq, P., Lourenço, C., Malgeri, L., Mannelli, M., Massironi, A., Meijers, F., Merlin, J.A., Mersi, S., Meschi, E., Milenovic, P., Moortgat, F., Mulders, M., Ngadiuba, J., Nourbakhsh, S., Orfanelli, S., Orsini, L., Pantaleo, F., Pape, L., Perez, E., Peruzzi, M., Petrilli, A., Petrucciani, G., Pfeiffer, A., Pierini, M., Pitters, F.M., Rabady, D., Racz, A., Reis, T., Rovere, M., Sakulin, H., Schäfer, C., Schwick, C., Selvaggi, M., Sharma, A., Silva, P., Sphicas, P., Stakia, A., Steggemann, J., Treille, D., Tsirou, A., Veckalns, V., Verzetti, M., Zeuner, W.D., Caminada, L., Deiters, K., Erdmann, W., Horisberger, R., Ingram, Q., Kaestli, H.C., Kotlinski, D., Langenegger, U., Rohe, T., Wiederkehr, S.A., Backhaus, M., Bäni, L., Berger, P., Chernyavskaya, N., Dissertori, G., Dittmar, M., Donegà, M., Dorfer, C., Gómez Espinosa, T.A., Grab, C., Hits, D., Klijnsma, T., Lustermann, W., Manzoni, R.A., Marionneau, M., Meinhard, M.T., Micheli, F., Musella, P., Nessi-Tedaldi, F., Pata, J., Pauss, F., Perrin, G., Perrozzi, L., Pigazzini, S., Quittnat, M., Reissel, C., Ruini, D., Sanz Becerra, D.A., Schönenberger, M., Shchutska, L., Tavolaro, V.R., Theofilatos, K., Vesterbacka Olsson, M.L., Wallny, R., Zhu, D.H., Aarrestad, T.K., Amsler, C., Brzhechko, D., Canelli, M.F., De Cosa, A., Del Burgo, R., Donato, S., Galloni, C., Hreus, T., Kilminster, B., Leontsinis, S., Neutelings, I., Rauco, G., Robmann, P., Salerno, D., Schweiger, K., Seitz, C., Takahashi, Y., Zucchetta, A., Doan, T.H., Khurana, R., Kuo, C.M., Lin, W., Pozdnyakov, A., Yu, S.S., Chang, P., Chao, Y., Chen, K.F., Chen, P.H., Hou, W.-S., Liu, Y.F., Lu, R.-S., Paganis, E., Psallidas, A., Steen, A., Asavapibhop, B., Srimanobhas, N., Suwonjandee, N., Bat, A., Boran, F., Cerci, S., Damarseckin, S., Demiroglu, Z.S., Dolek, F., Dozen, C., Dumanoglu, I., Girgis, S., Gokbulut, G., Guler, Y., Gurpinar, E., Hos, I., Isik, C., Kangal, E.E., Kara, O., Kayis Topaksu, A., Kiminsu, U., Oglakci, M., Onengut, G., Ozdemir, K., Ozturk, S., Sunar Cerci, D., Tali, B., Tok, U.G., Turkcapar, S., Zorbakir, I.S., Zorbilmez, C., Isildak, B., Karapinar, G., Yalvac, M., Zeyrek, M., Atakisi, I.O., Gülmez, E., Kaya, M., Kaya, O., Ozkorucuklu, S., Tekten, S., Yetkin, E.A., Agaras, M.N., Cakir, A., Cankocak, K., Komurcu, Y., Sen, S., Grynyov, B., Levchuk, L., Ball, F., Brooke, J.J., Burns, D., Clement, E., Cussans, D., Davignon, O., Flacher, H., Goldstein, J., Heath, G.P., Heath, H.F., Kreczko, L., Newbold, D.M., Paramesvaran, S., Penning, B., Sakuma, T., Smith, D., Smith, V.J., Taylor, J., Titterton, A., Bell, K.W., Belyaev, A., Brew, C., Brown, R.M., Cieri, D., Cockerill, D.J.A., Coughlan, J.A., Harder, K., Harper, S., Linacre, J., Manolopoulos, K., Olaiya, E., Petyt, D., Shepherd-Themistocleous, C.H., Thea, A., Tomalin, I.R., Williams, T., Womersley, W.J., Bainbridge, R., Bloch, P., Borg, J., Breeze, S., Buchmuller, O., Bundock, A., Colling, D., Dauncey, P., Davies, G., Della Negra, M., Di Maria, R., Hall, G., Iles, G., James, T., Komm, M., Laner, C., Lyons, L., Magnan, A.-M., Malik, S., Martelli, A., Nash, J., Nikitenko, A., Palladino, V., Pesaresi, M., Raymond, D.M., Richards, A., Rose, A., Scott, E., Seez, C., Shtipliyski, A., Singh, G., Stoye, M., Strebler, T., Summers, S., Tapper, A., Uchida, K., Virdee, T., Wardle, N., Winterbottom, D., Wright, J., Zenz, S.C., Cole, J.E., Hobson, P.R., Khan, A., Kyberd, P., Mackay, C.K., Morton, A., Reid, I.D., Teodorescu, L., Zahid, S., Call, K., Dittmann, J., Hatakeyama, K., Liu, H.,

Madrid, C., McMaster, B., Pastika, N., Smith, C., Bartek, R., Dominguez, A., Buccilli, A., Cooper, S.I., Henderson, C., Rumerio, P., West, C., Arcaro, D., Bose, T., Gastler, D., Pinna, D., Rankin, D., Richardson, C., Rohlf, J., Sulak, L., Zou, D., Benelli, G., Coubez, X., Cutts, D., Hadley, M., Hakala, J., Heintz, U., Hogan, J.M., Kwok, K.H.M., Laird, E., Landsberg, G., Lee, J., Mao, Z., Narain, M., Sagir, S., Syarif, R., Usai, E., Yu, D., Band, R., Brainerd, C., Breedon, R., Burns, D., Calderon De La Barca Sanchez, M., Chertok, M., Conway, J., Conway, R., Cox, P.T., Erbacher, R., Flores, C., Funk, G., Ko, W., Kukral, O., Lander, R., Mulhearn, M., Pellett, D., Pilot, J., Shalhout, S., Shi, M., Stolp, D., Taylor, D., Tos, K., Tripathi, M., Wang, Z., Zhang, F., Bachtis, M., Bravo, C., Cousins, R., Dasgupta, A., Florent, A., Hauser, J., Ignatenko, M., Mccoll, N., Regnard, S., Saltzberg, D., Schnaible, C., Valuev, V., Bouvier, E., Burt, K., Clare, R., Gary, J.W., Ghiasi Shirazi, S.M.A., Hanson, G., Karapostoli, G., Kennedy, E., Lacroix, F., Long, O.R., Olmedo Negrete, M., Paneva, M.I., Si, W., Wang, L., Wei, H., Wimpenny, S., Yates, B.R., Branson, J.G., Chang, P., Cittolin, S., Derdzinski, M., Gerosa, R., Gilbert, D., Hashemi, B., Holzner, A., Klein, D., Kole, G., Krutelyov, V., Letts, J., Masciovecchio, M., Olivito, D., Padhi, S., Pieri, M., Sani, M., Sharma, V., Simon, S., Tadel, M., Vartak, A., Wasserbaech, S., Wood, J., Würthwein, F., Yagil, A., Zevi Della Porta, G., Amin, N., Bhandari, R., Campagnari, C., Citron, M., Dutta, V., Franco Sevilla, M., Gouskos, L., Heller, R., Incandela, J., Mei, H., Ovcharova, A., Qu, H., Richman, J., Stuart, D., Suarez, I., Wang, S., Yoo, J., Anderson, D., Bornheim, A., Lawhorn, J.M., Lu, N., Newman, H.B., Nguyen, T.Q., Spiropulu, M., Vlimant, J.R., Wilkinson, R., Xie, S., Zhang, Z., Zhu, R.Y., Andrews, M.B., Ferguson, T., Mudholkar, T., Paulini, M., Sun, M., Vorobiev, I., Weinberg, M., Cumalat, J.P., Ford, W.T., Jensen, F., Johnson, A., MacDonald, E., Mulholland, T., Patel, R., Perloff, A., Stenson, K., Ulmer, K.A., Wagner, S.R., Alexander, J., Chaves, J., Cheng, Y., Chu, J., Datta, A., Mcdermott, K., Mirman, N., Patterson, J.R., Quach, D., Rinkevicius, A., Ryd, A., Skinnari, L., Soffi, L., Tan, S.M., Tao, Z., Thom, J., Tucker, J., Wittich, P., Zientek, M., Abdullin, S., Albrow, M., Alyari, M., Apollinari, G., Apresyan, A., Apyan, A., Banerjee, S., Bauerdick, L.A.T., Beretvas, A., Berryhill, J., Bhat, P.C., Burkett, K., Butler, J.N., Canepa, A., Cerati, G.B., Cheung, H.W.K., Chlebana, F., Cremonesi, M., Duarte, J., Elvira, V.D., Freeman, J., Gecse, Z., Gottschalk, E., Gray, L., Green, D., Grünendahl, S., Gutsche, O., Hanlon, J., Harris, R.M., Hasegawa, S., Hirschauer, J., Hu, Z., Jayatilaka, B., Jindariani, S., Johnson, M., Joshi, U., Klima, B., Kortelainen, M.J., Kreis, B., Lammel, S., Lincoln, D., Lipton, R., Liu, M., Liu, T., Lykken, J., Maeshima, K., Marraffino, J.M., Mason, D., McBride, P., Merkel, P., Mrenna, S., Nahn, S., O'Dell, V., Pedro, K., Pena, C., Prokofyev, O., Rakness, G., Ristori, L., Savoy-Navarro, A., Schneider, B., Sexton-Kennedy, E., Soha, A., Spalding, W.J., Spiegel, L., Stoynev, S., Strait, J., Strobbe, N., Taylor, L., Tkaczyk, S., Tran, N.V., Uplegger, L., Vaandering, E.W., Vernieri, C., Verzocchi, M., Vidal, R., Wang, M., Weber, H.A., Whitbeck, A., Acosta, D., Avery, P., Bortignon, P., Bourilkov, D., Brinkerhoff, A., Cadamuro, L., Carnes, A., Curry, D., Field, R.D., Gleyzer, S.V., Joshi, B.M., Konigsberg, J., Korytov, A., Lo, K.H., Ma, P., Matchev, K., Mitselmakher, G., Rosenzweig, D., Shi, K., Sperka, D., Wang, J., Wang, S., Zuo, X., Joshi, Y.R., Linn, S., Ackert, A., Adams, T., Askew, A., Hagopian, S., Hagopian, V., Johnson, K.F., Kolberg, T., Martinez, G., Perry, T., Prosper, H., Saha, A., Schiber, C., Yohay, R., Baarmand, M.M., Bhopatkar, V., Colafranceschi, S., Hohlmann, M., Noonan, D., Rahmani, M., Roy, T., Yumiceva, F., Adams, M.R., Apanasevich, L., Berry, D., Betts, R.R., Cavanaugh, R., Chen, X., Dittmer, S., Evdokimov, O., Gerber, C.E., Hangal, D.A., Hofman, D.J., Jung, K., Kamin, J., Mills, C., Tonjes, M.B., Varelas, N., Wang, H., Wang, X., Wu, Z., Zhang, J., Alhusseini, M., Bilki, B., Clarida, W., Dilsiz, K., Durgut, S., Gandrajula, R.P., Haytmyradov, M., Khristenko, V., Merlo, J.-P., Mestvirishvili, A., Moeller, A., Nachtman, J., Ogul, H., Onel, Y., Ozok, F., Penzo, A., Snyder, C., Tiras, E., Wetzel, J., Blumenfeld, B., Cocoros, A., Eminizer, N., Fehling, D., Feng, L., Gritsan, A.V., Hung, W.T., Maksimovic, P., Roskes, J., Sarica, U., Swartz, M., Xiao, M., You, C., Al-bataineh, A., Baringer, P., Bean, A., Boren, S., Bowen, J., Bylinkin, A., Castle, J., Khalil, S., Kropivnitskaya, A., Majumder, D., Mcbrayer, W., Murray, M., Rogan, C., Sanders, S., Schmitz, E., Tapia Takaki, J.D., Wang, Q., Duric, S., Ivanov, A., Kaadze, K., Kim, D., Maravin, Y., Mendis, D.R., Mitchell, T., Modak, A., Mohammadi, A., Rebassoo, F., Wright, D., Baden, A., Baron, O., Belloni, A., Eno, S.C., Feng, Y., Ferraioli, C., Hadley, N.J., Jabeen, S., Jeng, G.Y., Kellogg, R.G., Kunkle, J., Mignerey, A.C., Nabili, S., Ricci-Tam, F., Seidel, M., Shin, Y.H., Skuja, A., Tonwar, S.C., Wong, K., Abercrombie, D., Allen, B., Azzolini, V., Baty, A., Bauer, G., Bi, R., Brandt, S., Busza, W., Cali, I.A., D'Alfonso, M., Demiragli, Z., Gomez Ceballos, G., Goncharov, M., Harris, P., Hsu, D., Hu, M., Iiyama, Y., Innocenti, G.M., Klute, M., Kovalskyi, D., Lee, Y.-J., Luckey, P.D., Maier, B., Marini, A.C., Mcginn, C., Mironov, C., Narayanan, S., Niu, X., Paus, C., Roland, C., Roland, G., Shi, Z., Stephans, G.S.F., Sumorok, K., Tatar, K., Velicanu, D., Wang, J., Wang, T.W., Wyslouch, B., Benvenuti, A.C., Chatterjee, R.M., Evans, A., Hansen, P., Hiltbrand, J., Jain, S., Kalafut, S., Krohn, M., Kubota, Y., Lesko, Z., Mans, J., Ruckstuhl, N., Rusack, R., Wadud, M.A., Acosta, J.G., Oliveros, S., Avdeeva, E., Bloom, K., Claes, D.R., Fangmeier, C., Golf, F., Gonzalez Suarez, R., Kamalieddin, R., Kravchenko, I., Monroy, J., Siado, J.E., Snow, G.R., Stieger, B., Godshalk, A., Harrington, C., Iashvili, I., Kharchilava, A., Mclean, C., Nguyen, D., Parker, A., Rappoccio, S., Roozbahani, B., Alverson, G., Barberis, E., Freer, C., Haddad, Y., Hortiangtham, A., Morse, D.M., Orimoto, T., Wamorkar, T., Wang, B., Wisecarver, A., Wood, D., Bhattacharya, S., Bueghly, J., Charaf, O., Gunter, T., Hahn, K.A., Odell, N., Schmitt, M.H., Sung, K., Trovato, M., Velasco, M., Bucci, R., Dev, N., Hildreth, M., Hurtado Anampa, K., Jessop, C., Karmgard, D.J., Lannon, K., Li, W., Loukas, N., Marinelli, N., Meng, F., Mueller, C., Musienko, Y., Planer, M., Reinsvold, A., Ruchti, R., Siddireddy, P., Smith, G., Taroni, S., Wayne, M., Wightman, A., Wolf, M., Woodard, A., Alimena, J., Antonelli, L., Bylsma, B., Durkin, L.S., Flowers, S., Francis, B., Hill, C., Ji, W., Ling, T.Y., Luo, W., Winer, B.L., Cooperstein, S., Elmer, P., Hardenbrook, J., Haubrich, N., Higginbotham, S., Kalogeropoulos, A., Kwan, S., Lange, D., Lucchini, M.T., Luo, J., Marlow, D., Mei, K., Ojalvo, I., Olsen, J., Palmer, C., Piroué, P., Salfeld-Nebgen, J., Stickland, D., Tully, C., Malik, S., Norberg, S., Barker, A., Barnes, V.E., Das, S., Gutay, L., Jones, M., Jung, A.W., Khatiwada, A., Mahakud, B., Miller, D.H., Neumeister, N., Peng, C.C., Piperov, S., Qiu, H., Schulte, J.F., Sun, J., Wang, F., Xiao, R., Xie, W., Cheng, T., Dolen, J., Parashar, N., Chen, Z., Ecklund, K.M., Freed, S., Geurts, F.J.M., Kilpatrick, M., Kumar, A., Li, W., Padley, B.P., Redjimi, R., Roberts, J., Rorie, J., Shi, W., Tu, Z., Zhang, A., Bodek, A., de Barbaro, P., Demina, R., Duh, Y., Dulemba, J.L., Fallon, C., Ferbel, T., Galanti, M., Garcia-Bellido, A., Han, J., Hindrichs, O., Khukhunaishvili, A., Ranken, E., Tan, P., Taus, R.,

Chou, J.P., Gershtein, Y., Halkiadakis, E., Hart, A., Heindl, M., Hughes, E., Kaplan, S., Kunnawalkam Elayavalli, R., Kyriacou, S., Laflotte, I., Lath, A., Montalvo, R., Nash, K., Osherson, M., Saka, H., Salur, S., Schnetzer, S., Sheffield, D., Somalwar, S., Stone, R., Thomas, S., Thomassen, P., Delannoy, A.G., Heideman, J., Riley, G., Spanier, S., Bouhali, O., Celik, A., Dalchenko, M., De Mattia, M., Delgado, A., Dildick, S., Eusebi, R., Gilmore, J., Huang, T., Kamon, T., Luo, S., Marley, D., Mueller, R., Overton, D., Perniè, L., Rathjens, D., Safonov, A., Akchurin, N., Damgov, J., De Guio, F., Dudero, P.R., Kunori, S., Lamichhane, K., Lee, S.W., Mengke, T., Muthumuni, S., Peltola, T., Undleeb, S., Volobouev, I., Wang, Z., Greene, S., Gurrola, A., Janjam, R., Johns, W., Maguire, C., Melo, A., Ni, H., Padeken, K., Romeo, F., Ruiz Alvarez, J.D., Sheldon, P., Tuo, S., Velkovska, J., Verweij, M., Xu, Q., Arenton, M.W., Barria, P., Cox, B., Hirosky, R., Joyce, M., Ledovskoy, A., Li, H., Neu, C., Sinthuprasith, T., Wang, Y., Wolfe, E., Xia, F., Harr, R., Karchin, P.E., Poudyal, N., Sturdy, J., Thapa, P., Zaleski, S., Buchanan, J., Caillol, C., Carlsmith, D., Dasu, S., De Bruyn, I., Dodd, L., Gomber, B., Grothe, M., Herndon, M., Hervé, A., Hussain, U., Klabbers, P., Lanaro, A., Long, K., Loveless, R., Ruggles, T., Savin, A., Sharma, V., Smith, N., Smith, W.H., Woods, N., The CMS collaboration

View additional authors

Save all to author list

[a]Yerevan Physics Institute, Yerevan, Armenia
[b]Institut für Hochenergiephysik, Wien, Austria
[c]Institute for Nuclear Problems, Minsk, Belarus
[d]Universiteit Antwerpen, Antwerpen, Belgium
[e]Vrije Universiteit Brussel, Brussel, Belgium
[f]Université Libre de Bruxelles, Bruxelles, Belgium
[g]Ghent University, Ghent, Belgium
[h]Université Catholique de Louvain, Louvain-la-Neuve, Belgium
[i]Centro Brasileiro de Pesquisas Fisicas, Rio de Janeiro, Brazil
[j]Universidade do Estado do Rio de Janeiro, Rio de Janeiro, Brazil
[k]Universidade Estadual Paulista, São Paulo, Brazil
[l]Universidade Federal do ABC, São Paulo, Brazil
[m]Institute for Nuclear Research and Nuclear Energy, Bulgarian Academy of Sciences, Sofia, Bulgaria
[n]University of Sofia, Sofia, Bulgaria
[o]Beihang University, Beijing, China
[p]Institute of High Energy Physics, Beijing, China
[q]State Key Laboratory of Nuclear Physics and Technology, Peking University, Beijing, China
[r]Tsinghua University, Beijing, China
[s]Universidad de Los Andes, Bogota, Colombia
[t]University of Split, Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture, Split, Croatia
[u]University of Split, Faculty of Science, Split, Croatia
[v]Institute Rudjer Boskovic, Zagreb, Croatia
[w]University of Cyprus, Nicosia, Cyprus
[x]Charles University, Prague, Czech Republic
[y]Escuela Politecnica Nacional, Quito, Ecuador
[z]Universidad San Francisco de Quito, Quito, Ecuador
[aa]Academy of Scientific Research and Technology of the Arab Republic of Egypt, Egyptian Network of High Energy Physics, Cairo, Egypt
[ab]National Institute of Chemical Physics and Biophysics, Tallinn, Estonia
[ac]Department of Physics, University of Helsinki, Helsinki, Finland
[ad]Helsinki Institute of Physics, Helsinki, Finland
[ae]Lappeenranta University of Technology, Lappeenranta, Finland
[af]IRFU, CEA, Université Paris-Saclay, Gif-sur-Yvette, France
[ag]Laboratoire Leprince-Ringuet, Ecole polytechnique, CNRS/IN2P3, Université Paris-Saclay, Palaiseau, France
[ah]Université de Strasbourg, CNRS, IPHC UMR 7178, Strasbourg, France
[ai]Centre de Calcul de l'Institut National de Physique Nucleaire et de Physique des Particules, CNRS/IN2P3, Villeurbanne, France
[aj]Université de Lyon, Université Claude Bernard Lyon 1, CNRS-IN2P3, Institut de Physique Nucléaire de Lyon, Villeurbanne, France
[ak]Georgian Technical University, Tbilisi, Georgia
[al]Tbilisi State University, Tbilisi, Georgia
[am]RWTH Aachen University, I. Physikalisches Institut, Aachen, Germany
[an]RWTH Aachen University, III. Physikalisches Institut A, Aachen, Germany
[ao]RWTH Aachen University, III. Physikalisches Institut B, Aachen, Germany
[ap]Deutsches Elektronen-Synchrotron, Hamburg, Germany
[aq]University of Hamburg, Hamburg, Germany
[ar]Karlsruher Institut fuer Technologie, Karlsruhe, Germany
[as]Institute of Nuclear and Particle Physics (INPP), NCSR Demokritos, Aghia Paraskevi, Greece
[at]National and Kapodistrian University of Athens, Athens, Greece
[au]National Technical University of Athens, Athens, Greece
[av]University of Ioánnina, Ioánnina, Greece
[aw]MTA-ELTE Lendület CMS Particle and Nuclear Physics Group, Eötvös Loránd University, Budapest, Hungary
[ax]Wigner Research Centre for Physics, Budapest, Hungary
[ay]Institute of Nuclear Research ATOMKI, Debrecen, Hungary
[az]Institute of Physics, University of Debrecen, Debrecen, Hungary
[ba]Indian Institute of Science (IISc), Bangalore, India

[bb]National Institute of Science Education and Research, HBNI, Bhubaneswar, India
[bc]Panjab University, Chandigarh, India
[bd]University of Delhi, Delhi, India
[be]Saha Institute of Nuclear Physics, HBNI, Kolkata, India
[bf]Indian Institute of Technology Madras, Madras, India
[bg]Bhabha Atomic Research Centre, Mumbai, India
[bh]Tata Institute of Fundamental Research-A, Mumbai, India
[bi]Tata Institute of Fundamental Research-B, Mumbai, India
[bj]Indian Institute of Science Education and Research (IISER), Pune, India
[bk]Institute for Research in Fundamental Sciences (IPM), Tehran, Iran
[bl]University College Dublin, Dublin, Ireland
[bm]INFN Sezione di Bari, Bari, Italy
[bn]Università di Bari, Bari, Italy
[bo]Politecnico di Bari, Bari, Italy
[bp]INFN Sezione di Bologna, Bologna, Italy
[bq]Università di Bologna, Bologna, Italy
[br]INFN Sezione di Catania, Catania, Italy
[bs]Università di Catania, Catania, Italy
[bt]INFN Sezione di Firenze, Firenze, Italy
[bu]Università di Firenze, Firenze, Italy
[bv]INFN Laboratori Nazionali di Frascati, Frascati, Italy
[bw]INFN Sezione di Genova, Genova, Italy
[bx]Università di Genova, Genova, Italy
[by]INFN Sezione di Milano-Bicocca, Milano, Italy
[bz]Università di Milano-Bicocca, Milano, Italy
[ca]INFN Sezione di Napoli, Napoli, Italy
[cb]Università di Napoli 'Federico II', Napoli, Italy
[cc]Università della Basilicata, Potenza, Italy
[cd]Università G. Marconi, Roma, Italy
[ce]INFN Sezione di Padova, Padova, Italy
[cf]Università di Padova, Padova, Italy
[cg]Università di Trento, Trento, Italy
[ch]INFN Sezione di Pavia, Pavia, Italy
[ci]Università di Pavia, Pavia, Italy
[cj]INFN Sezione di Perugia, Perugia, Italy
[ck]Università di Perugia, Perugia, Italy
[cl]INFN Sezione di Pisa, Pisa, Italy
[cm]Università di Pisa, Pisa, Italy
[cn]Scuola Normale Superiore di Pisa, Pisa, Italy
[co]INFN Sezione di Roma, Rome, Italy
[cp]Sapienza Università di Roma, Rome, Italy
[cq]INFN Sezione di Torino, Torino, Italy
[cr]Università di Torino, Torino, Italy
[cs]Università del Piemonte Orientale, Novara, Italy
[ct]INFN Sezione di Trieste, Trieste, Italy
[cu]Università di Trieste, Trieste, Italy
[cv]Kyungpook National University, Daegu, South Korea
[cw]Chonnam National University, Institute for Universe and Elementary Particles, Kwangju, South Korea
[cx]Hanyang University, Seoul, South Korea
[cy]Korea University, Seoul, South Korea
[cz]Sejong University, Seoul, South Korea
[da]Seoul National University, Seoul, South Korea
[db]University of Seoul, Seoul, South Korea
[dc]Sungkyunkwan University, Suwon, South Korea
[dd]Vilnius University, Vilnius, Lithuania
[de]National Centre for Particle Physics, Universiti Malaya, Kuala Lumpur, Malaysia
[df]Universidad de Sonora (UNISON), Hermosillo, Mexico
[dg]Centro de Investigacion y de Estudios Avanzados del IPN, Mexico City, Mexico
[dh]Universidad Iberoamericana, Mexico City, Mexico
[di]Benemerita Universidad Autonoma de Puebla, Puebla, Mexico
[dj]Universidad Autónoma de San Luis Potosí, San Luis Potosí, Mexico
[dk]University of Auckland, Auckland, New Zealand
[dl]University of Canterbury, Christchurch, New Zealand
[dm]National Centre for Physics, Quaid-I-Azam University, Islamabad, Pakistan
[dn]National Centre for Nuclear Research, Swierk, Poland
[do]Institute of Experimental Physics, Faculty of Physics, University of Warsaw, Warsaw, Poland
[dp]Laboratório de Instrumentação e Física Experimental de Partículas, Lisboa, Portugal
[dq]Joint Institute for Nuclear Research, Dubna, Russian Federation
[dr]Petersburg Nuclear Physics Institute, Gatchina (St. Petersburg), Russian Federation
[ds]Institute for Nuclear Research, Moscow, Russian Federation
[dt]Institute for Theoretical and Experimental Physics, Moscow, Russian Federation
[du]Moscow Institute of Physics and Technology, Moscow, Russian Federation
[dv]National Research Nuclear University 'Moscow Engineering Physics Institute' (MEPhI), Moscow, Russian Federation
[dw]P.N. Lebedev Physical Institute, Moscow, Russian Federation
[dx]Skobeltsyn Institute of Nuclear Physics, Lomonosov Moscow State University, Moscow, Russian Federation

[dy]Novosibirsk State University (NSU), Novosibirsk, Russian Federation
[dz]Institute for High Energy Physics of National Research Centre 'Kurchatov Institute', Protvino, Russian Federation
[ea]National Research Tomsk Polytechnic University, Tomsk, Russian Federation
[eb]University of Belgrade, Faculty of Physics and Vinca Institute of Nuclear Sciences, Belgrade, Serbia
[ec]Centro de Investigaciones Energéticas Medioambientales y Tecnológicas (CIEMAT), Madrid, Spain
[ed]Universidad Autónoma de Madrid, Madrid, Spain
[ee]Universidad de Oviedo, Oviedo, Spain
[ef]Instituto de Física de Cantabria (IFCA), CSIC-Universidad de Cantabria, Santander, Spain
[eg]University of Ruhuna, Department of Physics, Matara, Sri Lanka
[eh]CERN, European Organization for Nuclear Research, Geneva, Switzerland
[ei]Paul Scherrer Institut, Villigen, Switzerland
[ej]ETH Zurich — Institute for Particle Physics and Astrophysics (IPA), Zurich, Switzerland
[ek]Universität Zürich, Zurich, Switzerland
[el]National Central University, Chung-Li, Taiwan
[em]National Taiwan University (NTU), Taipei, Taiwan
[en]Chulalongkorn University, Faculty of Science, Department of Physics, Bangkok, Thailand
[eo]Çukurova University, Physics Department, Science and Art Faculty, Adana, Turkey
[ep]Middle East Technical University, Physics Department, Ankara, Turkey
[eq]Bogazici University, Istanbul, Turkey
[er]Istanbul Technical University, Istanbul, Turkey
[es]Institute for Scintillation Materials of National Academy of Science of Ukraine, Kharkov, Ukraine
[et]National Scientific Center, Kharkov Institute of Physics and Technology, Kharkov, Ukraine
[eu]University of Bristol, Bristol, United Kingdom
[ev]Rutherford Appleton Laboratory, Didcot, United Kingdom
[ew]Imperial College, London, United Kingdom
[ex]Brunel University, Uxbridge, United Kingdom
[ey]Baylor University, Waco, United States
[ez]Catholic University of America, Washington, DC, United States
[fa]The University of Alabama, Tuscaloosa, United States
[fb]Boston University, Boston, United States
[fc]Brown University, Providence, United States
[fd]University of California, Davis, Davis, United States
[fe]University of California, Los Angeles, United States
[ff]University of California, Riverside, Riverside, United States
[fg]University of California, San Diego, La Jolla, United States
[fh]University of California, Santa Barbara — Department of Physics, Santa Barbara, United States
[fi]California Institute of Technology, Pasadena, United States
[fj]Carnegie Mellon University, Pittsburgh, United States
[fk]University of Colorado Boulder, Boulder, United States
[fl]Cornell University, Ithaca, United States
[fm]Fermi National Accelerator Laboratory, Batavia, United States
[fn]University of Florida, Gainesville, United States
[fo]Florida International University, Miami, United States
[fp]Florida State University, Tallahassee, United States
[fq]Florida Institute of Technology, Melbourne, United States
[fr]University of Illinois at Chicago (UIC), Chicago, United States
[fs]The University of Iowa, Iowa City, United States
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[fu]The University of Kansas, Lawrence, United States
[fv]Kansas State University, Manhattan, United States
[fw]Lawrence Livermore National Laboratory, Livermore, United States
[fx]University of Maryland, College Park, United States
[fy]Massachusetts Institute of Technology, Cambridge, United States
[fz]University of Minnesota, Minneapolis, United States
[ga]University of Mississippi, Oxford, United States
[gb]University of Nebraska-Lincoln, Lincoln, United States
[gc]State University of New York at Buffalo, Buffalo, United States
[gd]Northeastern University, Boston, United States
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[gg]The Ohio State University, Columbus, United States
[gh]Princeton University, Princeton, United States
[gi]University of Puerto Rico, Mayaguez, United States
[gj]Purdue University, West Lafayette, United States
[gk]Purdue University Northwest, Hammond, United States
[gl]Rice University, Houston, United States
[gm]University of Rochester, Rochester, United States
[gn]Rutgers, The State University of New Jersey, Piscataway, United States
[go]University of Tennessee, Knoxville, United States
[gp]Texas A&M University, College Station, United States
[gq]Texas Tech University, Lubbock, United States
[gr]Vanderbilt University, Nashville, United States
[gs]University of Virginia, Charlottesville, United States
[gt]Wayne State University, Detroit, United States
[gu]University of Wisconsin — Madison, Madison, WI, United States

[gv]Vienna University of Technology, Vienna, Austria
[gw]Universidade Estadual de Campinas, Campinas, Brazil
[gx]Federal University of Rio Grande do Sul, Porto Alegre, Brazil
[gy]University of Chinese Academy of Sciences, Beijing, China
[gz]British University in Egypt, Cairo, Egypt
[ha]Cairo University, Cairo, Egypt
[hb]Ain Shams University, Cairo, Egypt
[hc]Department of Physics, King Abdulaziz University, Jeddah, Saudi Arabia
[hd]Université de Haute Alsace, Mulhouse, France
[he]Ilia State University, Tbilisi, Georgia
[hf]Brandenburg University of Technology, Cottbus, Germany
[hg]Indian Institute of Technology Bhubaneswar, Bhubaneswar, India
[hh]Institute of Physics, Bhubaneswar, India
[hi]Shoolini University, Solan, India
[hj]University of Visva-Bharati, Santiniketan, India
[hk]Isfahan University of Technology, Isfahan, Iran
[hl]Plasma Physics Research Center, Science and Research Branch, Islamic Azad University, Tehran, Iran
[hm]Università degli Studi di Siena, Siena, Italy
[hn]Scuola Normale e Sezione dell'INFN, Pisa, Italy
[ho]Kyunghee University, Seoul, South Korea
[hp]International Islamic University of Malaysia, Kuala Lumpur, Malaysia
[hq]Malaysian Nuclear Agency, MOSTI, Kajang, Malaysia
[hr]Consejo Nacional de Ciencia y Tecnología, Mexico City, Mexico
[hs]Warsaw University of Technology, Institute of Electronic Systems, Warsaw, Poland
[ht]St. Petersburg State Polytechnical University, St. Petersburg, Russian Federation
[hu]Budker Institute of Nuclear Physics, Novosibirsk, Russian Federation
[hv]Faculty of Physics, University of Belgrade, Belgrade, Serbia
[hw]Riga Technical University, Riga, Latvia
[hx]Stefan Meyer Institute for Subatomic Physics (SMI), Vienna, Austria
[hy]Adiyaman University, Adiyaman, Turkey
[hz]Istanbul Aydin University, Istanbul, Turkey
[ia]Mersin University, Mersin, Turkey
[ib]Piri Reis University, Istanbul, Turkey
[ic]Gaziosmanpasa University, Tokat, Turkey
[id]Ozyegin University, Istanbul, Turkey
[ie]Izmir Institute of Technology, Izmir, Turkey
[if]Marmara University, Istanbul, Turkey
[ig]Kafkas University, Kars, Turkey
[ih]Istanbul University, Faculty of Science, Istanbul, Turkey
[ii]Istanbul Bilgi University, Istanbul, Turkey
[ij]Hacettepe University, Ankara, Turkey
[ik]School of Physics and Astronomy, University of Southampton, Southampton, United Kingdom
[il]Monash University, Faculty of Science, Clayton, Australia
[im]Bethel University, St. Paul, United States
[in]Karamanoğlu Mehmetbey University, Karaman, Turkey
[io]Utah Valley University, Orem, United States
[ip]Beykent University, Istanbul, Turkey
[iq]Bingol University, Bingol, Turkey
[ir]Sinop University, Sinop, Turkey
[is]Mimar Sinan University, Istanbul, Istanbul, Turkey
[it]Texas A&M University at Qatar, Doha, Qatar
[iu]CERN, Geneva 23, CH-1211, Switzerland

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Abstract

A search for dark matter produced in association with top quarks in proton-proton collisions at a center-of-mass energy of 13 TeV is presented. The data set used corresponds to an integrated luminosity of 35.9 fb $^{-1}$ recorded with the CMS detector at the LHC. Whereas previous searches for neutral scalar or pseudoscalar mediators considered dark matter production in association with a top quark pair only, this analysis also includes production modes with a single top quark. The results are derived from the combination of multiple selection categories that are defined to target either the single top quark or the top quark pair signature. No significant deviations with respect to the standard model predictions are observed. The results are interpreted in the context of a simplified model in which a scalar or pseudoscalar mediator particle couples to a top quark and subsequently decays into dark matter particles. Scalar and pseudoscalar mediator particles with masses below 290 and 300 GeV, respectively, are excluded at 95% confidence level, assuming a dark matter particle mass of 1 GeV and mediator couplings to fermions and dark matter particles equal to unity.[Figure not available: see fulltext.]. © 2019, The Author(s).

SciVal Topic Prominence

Topic: Collisions | Jets | Proton–proton collisions

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