



Erratum to: Measurement of the top quark mass with lepton+jets final states using pp collisions at $\sqrt{s} = 13$ TeV

CMS Collaboration*

CERN, 1211 Geneva 23, Switzerland

Published online: 13 April 2022

© CERN for the benefit of the CMS collaboration 2022

Erratum to: Eur. Phys. J. C (2018) 78:891

<https://doi.org/10.1140/epjc/s10052-018-6332-9>

In this article the author name Luigi Calligaris was incorrectly written as A. Calligaris. The original article has been corrected.

Open Access This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>.

Funded by SCOAP³.



The original article can be found online at <https://doi.org/10.1140/epjc/s10052-018-6332-9>.

*e-mail: cms-publication-committee-chair@cern.ch

CMS Collaboration**Yerevan Physics Institute, Yerevan, Armenia**

A. M. Sirunyan, A. Tumasyan


Institut für Hochenergiephysik, Vienna, Austria

W. Adam, F. Ambrogio, E. Asilar, T. Bergauer, J. Brandstetter, E. Brondolin, M. Dragicevic , J. Erö,
 A. Escalante Del Valle, M. Flechl, M. Friedl, R. Frühwirth¹, V. M. Ghete, J. Hrubec, M. Jeitler¹, N. Krammer,
 I. Krätschmer , D. Liko, T. Madlener, I. Mikulec, N. Rad, H. Rohringer, J. Schieck¹, R. Schöfbeck, M. Spanring,
 D. Spitzbart, A. Taurok, W. Waltenberger, J. Wittmann, C.-E. Wulz¹, M. Zarucki

Institute for Nuclear Problems, Minsk, Belarus

V. Chekhovsky, V. Mossolov, J. Suarez Gonzalez

Universiteit Antwerpen, Antwerp, BelgiumE. A. De Wolf, D. Di Croce, X. Janssen, J. Lauwers, M. Pieters, M. Van De Klundert, H. Van Haevermaet,
P. Van Mechelen, N. Van Remortel**Vrije Universiteit Brussel, Brussels, Belgium**

S. Abu Zeid, F. Blekman , J. D'Hondt, I. De Bruyn, J. De Clercq, K. Deroover, G. Flouris, D. Lontkovskyi, S. Lowette ,
 I. Marchesini, S. Moortgat, L. Moreels, Q. Python , K. Skovpen, S. Tavernier, W. Van Doninck, P. Van Mulders,
 I. Van Parijs







Université Libre de Bruxelles, Brussels, Belgium

D. Beghin, B. Bilin, H. Brun, B. Clerbaux, G. De Lentdecker, H. Delannoy, B. Dorney, G. Fasanella, L. Favart,
 R. Goldouzian, A. Grebenyuk, A. K. Kalsi, T. Lenzi, J. Luetic, T. Seva, E. Starling, C. Vander Velde, P. Vanlaer,
 D. Vannerom, R. Yonamine







Ghent University, Ghent, Belgium

T. Cornelis, D. Dobur, A. Fagot, M. Gul, I. Khvastunov², D. Poyraz, C. Roskas, D. Trocino, M. Tytgat, W. Verbeke,
 B. Vermassen, M. Vit, N. Zaganidis



Université Catholique de Louvain, Louvain-la-Neuve, Belgium

H. Bakhshiansohi, O. Bondu , S. Brochet, G. Bruno, C. Caputo , A. Caudron, P. David , S. De Visscher, C. Delaere,
 M. Delcourt, B. Francois, A. Giammanco , G. Krintiras, V. Lemaitre, A. Magitteri, A. Mertens, M. Musich,
 K. Piotrkowski, L. Quertenmont , A. Saggio, M. Vidal Marono , S. Wertz, J. Zobec

Centro Brasileiro de Pesquisas Físicas, Rio de Janeiro, BrazilW. L. Aldá Júnior, F. L. Alves, G. A. Alves , L. Brito, G. Correia Silva, C. Hensel, A. Moraes, M. E. Pol, P. Rebello Teles**Universidade do Estado do Rio de Janeiro, Rio de Janeiro, Brazil**

E. Belchior Batista Das Chagas, W. Carvalho , J. Chinellato³, E. Coelho, E. M. Da Costa, G. G. Da Silveira ,
 D. De Jesus Damiao, S. Fonseca De Souza, H. Malbouisson, M. Medina Jaime⁵, M. Melo De Almeida, C. Mora Herrera ,
 L. Mundim , H. Nogima, L. J. Sanchez Rosas, A. Santoro, A. Sznajder , M. Thiel, E. J. Tonelli Manganote³,
 F. Torres Da Silva De Araujo, A. Vilela Pereira 

Universidade Estadual Paulista^a, Universidade Federal do ABC^b, São Paulo, Brazil

S. Ahuja , C. A. Bernardes^a, Luigi Calligaris^a, T. R. Fernandez Perez Tomei^a, E. M. Gregores^b, P. G. Mercadante^b,
 S. F. Novaes , Sandra S. Padula^a, D. Romero Abad^b, J. C. Ruiz Vargas^a

Institute for Nuclear Research and Nuclear Energy, Bulgarian Academy of Sciences, Sofia, Bulgaria

A. Aleksandrov, R. Hadjiiska, P. Iaydjiev, A. Marinov, M. Misheva, M. Rodozov, M. Shopova, G. Sultanov

University of Sofia, Sofia, Bulgaria


A. Dimitrov, L. Litov, B. Pavlov, P. Petkov

Beihang University, Beijing, ChinaW. Fang⁶, X. Gao⁶, L. Yuan

Institute of High Energy Physics, Beijing, China

M. Ahmad, J. G. Bian , G. M. Chen , H. S. Chen , M. Chen, Y. Chen, C. H. Jiang, D. Leggat, H. Liao, Z. Liu , F. Romeo, S. M. Shaheen, A. Spiezia, J. Tao, C. Wang , Z. Wang , E. Yazgan , H. Zhang, J. Zhao 



State Key Laboratory of Nuclear Physics and Technology, Peking University, Beijing, China

Y. Ban, G. Chen , J. Li, Q. Li, S. Liu, Y. Mao, S. J. Qian, D. Wang, Z. Xu

Tsinghua University, Beijing, China

Y. Wang

Universidad de Los Andes, Bogota, Colombia

C. Avila , A. Cabrera, C. A. Carrillo Montoya, L. F. Chaparro Sierra, C. Florez , C. F. González Hernández, M. A. Segura Delgado



University of Split, Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture, Split, Croatia

B. Courbon, N. Godinovic, D. Lelas, I. Puljak, T. Sculac

University of Split, Faculty of Science, Split, Croatia

Z. Antunovic, M. Kovac

Institute Rudjer Boskovic, Zagreb, Croatia

V. Brigljevic, D. Ferencek , K. Kadija, B. Mesic, A. Starodumov⁷, T. Susa 


University of Cyprus, Nicosia, Cyprus

M. W. Ather, A. Attikis, G. Mavromanolakis, J. Mousa , C. Nicolaou, F. Ptochos , P. A. Razis, H. Rykaczewski

Charles University, Prague, Czech Republic

M. Finger⁸, M. Finger Jr.⁸

Universidad San Francisco de Quito, Quito, Ecuador

E. Carrera Jarrin 


Academy of Scientific Research and Technology of the Arab Republic of Egypt, Egyptian Network of High Energy Physics, Cairo, Egypt

M. A. Mahmoud ^{9,10}, Elgammal A. Mohamed ¹¹, E. Salama^{10,12}

National Institute of Chemical Physics and Biophysics, Tallinn, Estonia

S. Bhowmik, R. K. Dewanjee, M. Kadastik, L. Perrini, M. Raidal, C. Veelken

Department of Physics, University of Helsinki, Helsinki, Finland

P. Eerola, H. Kirschenmann, J. Pekkanen, M. Voutilainen 




Helsinki Institute of Physics, Helsinki, Finland

J. Havukainen, J. K. Heikkilä, T. Järvinen, V. Karimäki, R. Kinnunen, T. Lampén, K. Lassila-Perini, S. Laurila, S. Lehti, T. Lindén, P. Luukka, T. Mäenpää, H. Siikonen, E. Tuominen, J. Tuominiemi








Lappeenranta University of Technology, Lappeenranta, Finland

T. Tuuva

IRFU, CEA, Université Paris-Saclay, Gif-sur-Yvette, France

M. Besancon, F. Couderc , M. Dejaradin, D. Denegri, J. L. Faure, F. Ferri , S. Ganjour, S. Ghosh¹³, A. Givernaud, P. Gras, G. Hamel de Monchenault , P. Jarry, C. Leloup, E. Locci, M. Mached, J. Malcles, G. Negro, J. Rander, A. Rosowsky, M.Ö. Sahin, M. Titov

Laboratoire Leprince-Ringuet, Ecole polytechnique, CNRS/IN2P3, Université Paris-Saclay, Palaiseau, France

A. Abdulsalam¹⁴, C. Amendola, I. Antropov, S. Baffioni, F. Beaudette, P. Busson, L. Cadamuro, C. Charlot, R. Granier de Cassagnac , M. Jo , I. Kucher, S. Lisniak, A. Lobanov , J. Martin Blanco, M. Nguyen , C. Ochando, G. Ortona , P. Paganini, P. Pigard, R. Salerno , J. B. Sauvan, Y. Sirois, A. G. Stahl Leiton , Y. Yilmaz, A. Zabi, A. Zghiche

Université de Strasbourg, CNRS, IPHC UMR 7178, 67000 Strasbourg, France

J.-L. Agram¹⁵, J. Andrea, D. Bloch, J.-M. Brom, E. C. Chabert, C. Collard, E. Conte¹⁵, X. Coubez, F. Drouhin¹⁵, J.-C. Fontaine¹⁵, D. Gelé, U. Goerlach, M. Jansová, P. Juillot, A.-C. Le Bihan, N. Tonon, P. Van Hove

Centre de Calcul de l'Institut National de Physique Nucleaire et de Physique des Particules, CNRS/IN2P3, Villeurbanne, France

S. Gadrat

Université de Lyon, Université Claude Bernard Lyon 1, CNRS-IN2P3, Institut de Physique Nucléaire de Lyon, Villeurbanne, France

S. Beauceron, C. Bernet, G. Boudoul, N. Chanon, R. Chierici, D. Contardo, P. Depasse, H. El Mamouni, J. Fay, L. Finco¹⁶, S. Gascon, M. Gouzevitch, G. Grenier, B. Ille, F. Lagarde, I. B. Laktineh, H. Lattaud, M. Lethuillier, L. Mirabito, A. L. Pequegnot, S. Perries, A. Popov¹⁶, V. Sordini, M. Vander Donckt, S. Viret, S. Zhang

Georgian Technical University, Tbilisi, Georgia

T. Toriashvili¹⁷

Tbilisi State University, Tbilisi, Georgia

Z. Tsamalaizze⁸

RWTH Aachen University, I. Physikalisches Institut, Aachen, Germany

C. Autermann, L. Feld, M. K. Kiesel, K. Klein, M. Lipinski, M. Preuten, M. P. Rauch, C. Schomakers, J. Schulz, M. Teroerde, B. Wittmer, V. Zhukov¹⁶

RWTH Aachen University, III. Physikalisches Institut A, Aachen, Germany

A. Albert, D. Duchardt, M. Endres, M. Erdmann, S. Erdweg, T. Esch, R. Fischer, A. Güth, T. Hebbeker¹⁶, C. Heidemann¹⁶, K. Hoepfner, S. Knutzen, M. Merschmeyer, A. Meyer, P. Millet, S. Mukherjee, T. Pook¹⁶, M. Radziej, H. Reithler, M. Rieger, F. Scheuch, D. Teyssier, S. Thüer

RWTH Aachen University, III. Physikalisches Institut B, Aachen, Germany

G. Flügge, B. Kargoll, T. Kress, A. Künsken, T. Müller, A. Nehr Korn, A. Nowack, C. Pistone, O. Pooth, A. Stahl¹⁸

Deutsches Elektronen-Synchrotron, Hamburg, Germany

M. Aldaya Martin, T. Arndt, C. Asawatangtrakuldee, I. Babounikau, K. Beernaert, O. Behnke, U. Behrens, A. Bermúdez Martínez, D. Bertsche, A. A. Bin Anuar, K. Borras¹³, V. Botta, A. Campbell, P. Connor, C. Contreras-Campana, F. Costanza, V. Danilov, A. De Wit, C. Diez Pardos, D. Domínguez Damiani, G. Eckerlin, D. Eckstein, T. Eichhorn, A. Elwood¹⁶, E. Eren, E. Gallo¹⁹, J. Garay Garcia, A. Geiser, J. M. Grados Luyando, A. Grohsjean¹⁶, P. Gunnellini, M. Guthoff, A. Harb, J. Hauk, H. Jung, M. Kasemann¹⁶, J. Keaveney, C. Kleinwort, J. Knolle, I. Korol, D. Krücker, W. Lange, A. Lelek, T. Lenz, K. Lipka, W. Lohmann²⁰, R. Mankel, I.-A. Melzer-Pellmann, A. B. Meyer, M. Meyer, M. Missiroli¹⁶, G. Mittag, J. Mnich, A. Mussgiller, S. K. Pflitsch, D. Pitzl, A. Raspereza, M. Savitskyi, P. Saxena, C. Schwanenberger¹⁶, R. Shevchenko, A. Singh, N. Stefaniuk, H. Tholen, G. P. Van Onsem, R. Walsh, Y. Wen¹⁶, K. Wichmann, C. Wissing, O. Zenaiev

University of Hamburg, Hamburg, Germany

R. Aggleton, S. Bein, V. Blobel, M. Centis Vignali, T. Dreyer, C. Garbers, E. Garutti¹⁶, D. Gonzalez, J. Haller, A. Hinzmann, M. Hoffmann, A. Karavdina, G. Kasieczka, R. Klanner¹⁶, R. Kogler, N. Kovalchuk, S. Kurz, V. Kutzner, J. Lange, D. Marconi, J. Multhaupt, M. Niedziela, D. Nowatschin, T. Peiffer, A. Perieanu, A. Reimers, C. Scharf¹⁶, P. Schleper, A. Schmidt¹⁶, S. Schumann, J. Schwandt¹⁶, J. Sonneveld, H. Stadie, G. Steinbrück, F. M. Stober¹⁶, M. Stöver, D. Troendle, E. Usai, A. Vanhoefer, B. Vormwald¹⁶

Institut für Experimentelle Teilchenphysik, Karlsruhe, Germany

M. Akbiyik, C. Barth, M. Baselga, S. Baur, E. Butz, R. Caspart, T. Chwalek, F. Colombo, W. De Boer, A. Dierlamm, N. Faltermann, B. Freund, R. Friese, M. Giffels, M. A. Harrendorf, F. Hartmann¹⁸, S. M. Heindl, U. Husemann¹⁶, F. Kassel¹⁸, S. Kudella, H. Mildner, M. U. Mozer, Th. Müller, M. Plagge, G. Quast, K. Rabbertz, M. Schröder, I. Shvetsov, G. Sieber, H. J. Simonis, R. Ulrich¹⁶, S. Wayand, M. Weber, T. Weiler, S. Williamson, C. Wöhrmann, R. Wolf

Institute of Nuclear and Particle Physics (INPP), NCSR Demokritos, Aghia Paraskevi, Greece

G. Anagnostou, G. Daskalakis, T. Geralis, A. Kyriakis, D. Loukas, I. Topsis-Giotis

National and Kapodistrian University of Athens, Athens, Greece

G. Karathanasis, S. Kesiosoglou, A. Panagiotou, N. Saoulidou, E. Tziaferi

National Technical University of Athens, Athens, Greece

K. Kousouris, I. Papakrivopoulos

University of Ioánnina, Ioánnina, Greece

I. Evangelou, C. Foudas, P. Giannios, P. Katsoulis, P. Kokkas, S. Mallios, N. Manthos, I. Papadopoulos, E. Paradas, J. Strologas, F. A. Triantis, D. Tsitsonis

MTA-ELTE Lendület CMS Particle and Nuclear Physics Group, Eötvös Loránd University, Budapest, Hungary

M. Csanad , N. Filipovic, G. Pasztor , O. Surányi, G. I. Veres 


Wigner Research Centre for Physics, Budapest, Hungary

G. Bencze, C. Hajdu, D. Horvath²¹, Á. Hunyadi, F. Sikler, T.Á. Vámi, V. Veszpremi, G. Vesztergombi

Institute of Nuclear Research ATOMKI, Debrecen, Hungary

N. Beni, S. Czellar, J. Karancsi²³, A. Makovec, J. Molnar, Z. Szillasi

Institute of Physics, University of Debrecen, Debrecen, Hungary

M. Bartók , P. Raics, Z. L. Trocsanyi, B. Ujvari

Indian Institute of Science (IISc), Bangalore, India

S. Choudhury, J. R. Komaragiri 

National Institute of Science Education and Research, Bhubaneswar, India

S. Bahinipati²⁴, P. Mal, K. Mandal, A. Nayak²⁵, D. K. Sahoo²⁴, S. K. Swain

Panjab University, Chandigarh, India

S. Bansal, S. B. Beri, V. Bhatnagar, S. Chauhan, R. Chawla, N. Dhingra, R. Gupta, A. Kaur, M. Kaur, S. Kaur, R. Kumar, P. Kumari, M. Lohan, A. Mehta, S. Sharma, J. B. Singh, G. Walia

University of Delhi, Delhi, India

A. Bhardwaj, B. C. Choudhary , R. B. Garg, S. Keshri , A. Kumar , Ashok Kumar, S. Malhotra, M. Naimuddin, K. Ranjan, Aashaq Shah , R. Sharma 


Saha Institute of Nuclear Physics, HBNI, Kolkata, India

R. Bhardwaj²⁶, R. Bhattacharya, S. Bhattacharya, U. Bhawandeep²⁶, D. Bhowmik, S. Dey, S. Dutt²⁶, S. Dutta, S. Ghosh, N. Majumdar, K. Mondal, S. Mukhopadhyay, S. Nandan, A. Purohit, P. K. Rout, A. Roy, S. Roy Chowdhury, S. Sarkar, M. Sharan, B. Singh, S. Thakur²⁶


Indian Institute of Technology Madras, Madras, India

P. K. Behera

Bhabha Atomic Research Centre, Mumbai, India

R. Chudasama, D. Dutta, V. Jha, V. Kumar, A. K. Mohanty¹⁸, P. K. Netrakanti, L. M. Pant, P. Shukla , A. Topkar

Tata Institute of Fundamental Research-A, Mumbai, India

T. Aziz, S. Dugad, B. Mahakud, S. Mitra, G. B. Mohanty, N. Sur , B. Sutar



Tata Institute of Fundamental Research-B, Mumbai, India




















































































































































































S. Banerjee, S. Bhattacharya, S. Chatterjee, P. Das, M. Guchait, Sa. Jain, S. Kumar, M. Maity²⁷, G. Majumder, K. Mazumdar, N. Sahoo, T. Sarkar²⁷, N. Wickramage²⁸










Indian Institute of Science Education and Research (IISER), Pune, India

S. Chauhan , S. Dube , V. Hegde, A. Kapoor , K. Kothekar, S. Pandey, A. Rane, S. Sharma 

Institute for Research in Fundamental Sciences (IPM), Tehran, Iran

S. Chenarani²⁹, E. Eskandari Tadavani , S. M. Etesami²⁹, M. Khakzad, M. Mohammadi Najafabadi , M. Naseri, S. Paktinat Mehdiabadi³⁰, F. Rezaei Hosseinabadi, B. Safarzadeh³¹, M. Zeinali






















University College Dublin, Dublin, IrelandM. Felcini , M. Grunewald **INFN Sezione di Bari^a, Università di Bari^b, Politecnico di Bari^c, Bari, Italy**M. Abbrescia , C. Calabria , A. Colaleo , D. Creanza , L. Cristella , N. De Filippis , M. De Palma , A. Di Florio , F. Errico , L. Fiore , A. Gelmi , G. Iaselli , S. Lezki , G. Maggi , M. Maggi , B. Marangelli , G. Miniello , S. My , S. Nuzzo , A. Pompili , G. Pugliese , R. Radogna , A. Ranieri , G. Selvaggi , A. Sharma , L. Silvestris ,¹⁸ R. Venditti , P. Verwilligen , G. Zito **INFN Sezione di Bologna^a, Università di Bologna^b, Bologna, Italy**G. Abbiendi , C. Battilana , D. Bonacorsi , L. Borgonovi , S. Braibant-Giacomelli , L. Brigliadori , R. Campanini , P. Capiluppi , A. Castro , F. R. Cavallo , S. S. Chhibra , G. Codispoti , M. Cuffiani , G. M. Dallavalle , F. Fabbri , A. Fanfani , D. Fasanella , P. Giacomelli , C. Grandi , L. Guiducci , F. Iemmi , S. Marcellini , G. Masetti , A. Montanari , F. L. Navarria , A. Perrotta , T. Rovelli , G. P. Siroli , N. Tosi **INFN Sezione di Catania^a, Università di Catania^b, Catania, Italy**S. Albergo , S. Costa , A. Di Mattia , F. Giordano , R. Potenza , A. Tricomi , C. Tuve **INFN Sezione di Firenze^a, Università di Firenze^b, Florence, Italy**G. Barbagli , K. Chatterjee , V. Ciulli , C. Civinini , R. D'Alessandro , E. Focardi , G. Latino , P. Lenzi , M. Meschini , S. Paoletti , L. Russo ,³² G. Sguazzoni , D. Strom , L. Viliani **INFN Laboratori Nazionali di Frascati, Frascati, Italy**L. Benussi , S. Bianco , F. Fabbri , D. Piccolo , F. Primavera ,¹⁸**INFN Sezione di Genova^a, Università di Genova^b, Genova, Italy**V. Calvelli , F. Ferro , F. Ravera , E. Robutti , S. Tosi **INFN Sezione di Milano-Bicocca^a, Università di Milano-Bicocca^b, Milano, Italy**A. Benaglia , A. Beschi , L. Brianza , F. Brivio , V. Ciriolo ,¹⁸ M. E. Dinardo , S. Fiorendi , S. Gennai , A. Ghezzi , P. Govoni , M. Malberti , S. Malvezzi , R. A. Manzoni , D. Menasce , L. Moroni , M. Paganoni , K. Pauwels , D. Pedrini , S. Pigazzini ,³³ S. Ragazzi , T. Tabarelli de Fatis **INFN Sezione di Napoli^a, Università di Napoli 'Federico II'^b, Naples, Italy, Università della Basilicata^c, Potenza, Italy, Università G. Marconi^d, Roma, Italy**S. Buontempo , N. Cavallo , S. Di Guida ,¹⁸ F. Fabozzi , F. Fienga , G. Galati , A. O. M. Iorio , W. A. Khan , L. Lista , S. Meola ,¹⁸ P. Paolucci ,¹⁸ C. Sciacca , F. Thyssen , E. Voevodina **INFN Sezione di Padova^a, Università di Padova^b, Padua, Italy, Università di Trento^c, Trento, Italy**P. Azzi , N. Bacchetta , L. Benato , D. Bisello , A. Boletti , R. Carlin , P. Checchia , M. Dall'Osso , P. De Castro Manzano , T. Dorigo , U. Dosselli , F. Gasparini , U. Gasparini , A. Gozzelino , S. Lacaprarà , P. Lujan , M. Margoni , A. T. Meneguzzo , N. Pozzobon , P. Ronchese , R. Rossin , F. Simonetto , A. Tiko , E. Torassa , S. Ventura , M. Zanetti , P. Zotto **INFN Sezione di Pavia^a, Università di Pavia^b, Pavia, Italy**A. Braghieri , A. Magnani , P. Montagna , S. P. Ratti , V. Re , M. Ressegotti , C. Riccardi , P. Salvini , I. Vai , P. Vitulo **INFN Sezione di Perugia^a, Università di Perugia^b, Perugia, Italy**L. Alunni Solestizi , M. Biasini , G. M. Bilei , C. Cecchi , D. Ciangottini , L. Fanò , P. Lariccia , R. Leonardi , E. Manoni , G. Mantovani , V. Mariani , M. Menichelli , A. Rossi , A. Santocchia , D. Spiga **INFN Sezione di Pisa^a, Università di Pisa^b, Scuola Normale Superiore di Pisa^c, Pisa, Italy**K. Androsov , P. Azzurri , G. Bagliesi , L. Bianchini , T. Boccali , L. Borrello , R. Castaldi , M. A. Ciocci , R. Dell'Orso , G. Fedi , L. Giannini ,^{a,c} A. Giassi , M. T. Grippo , F. Ligabue 

T. Lomtadze ^a, E. Manca^{a,c}, G. Mandorli^{a,c}, A. Messineo ^{a,b}, F. Palla ^a, A. Rizzi ^{a,b}, P. Spagnolo ^a, R. Tenchini ^a, G. Tonelli ^{a,b}, A. Venturi ^a, P. G. Verdini ^a







INFN Sezione di Roma^a, Sapienza Università di Roma^b, Rome, Italy

L. Barone^{a,b}, F. Cavallari ^a, M. Cipriani^{a,b}, N. Daci^a, D. Del Re ^{a,b}, E. Di Marco ^{a,b}, M. Diemoz ^a, S. Gelli ^{a,b}, E. Longo ^{a,b}, B. Marzocchi ^{a,b}, P. Meridiani ^a, G. Organtini ^{a,b}, F. Pandolfi^a, R. Paramatti ^{a,b}, F. Preiato ^{a,b}, S. Rahatlou ^{a,b}, C. Rovelli ^a, F. Santanastasio ^{a,b}





INFN Sezione di Torino^a, Università di Torino^b, Torino, Italy, Università del Piemonte Orientale^c, Novara, Italy

N. Amapane^{a,b}, R. Arcidiacono ^{a,c}, S. Argiro ^{a,b}, M. Arneodo ^{a,c}, N. Bartosik^a, R. Bellan ^{a,b}, C. Biino ^a, N. Cartiglia ^a, R. Castello^{a,b}, F. Cenna^{a,b}, M. Costa ^{a,b}, R. Covarelli ^{a,b}, A. Degano^{a,b}, N. Demaria ^a, B. Kiani^{a,b}, C. Mariotti ^a, S. Maselli ^a, E. Migliore ^{a,b}, V. Monaco ^{a,b}, E. Monteil ^{a,b}, M. Monteno^a, M. M. Obertino ^{a,b}, L. Pacher^{a,b}, N. Pastrone ^a, M. Pelliccioni ^a, G. L. Pinna Angioni^{a,b}, A. Romero ^{a,b}, M. Ruspa ^{a,c}, R. Sacchi ^{a,b}, K. Shchelina^{a,b}, V. Sola^a, A. Solano^{a,b}, A. Staiano ^a

INFN Sezione di Trieste^a, Università di Trieste^b, Trieste, Italy

S. Belforte ^a, V. Candelise ^{a,b}, M. Casarsa ^a, F. Cossutti ^a, G. Della Ricca ^{a,b}, F. Vazzoler^{a,b}, A. Zanetti ^a

Kyungpook National University, Daegu, Korea

D. H. Kim, G. N. Kim ^a, M. S. Kim, J. Lee, S. Lee, S. W. Lee ^a, C. S. Moon, Y. D. Oh ^a, S. Sekmen, D. C. Son ^a, Y. C. Yang

Chonnam National University, Institute for Universe and Elementary Particles, Kwangju, Korea

H. Kim, D. H. Moon ^a, G. Oh


Hanyang University, Seoul, Korea

J. A. Brochero Cifuentes ^a, J. Goh ^a, T. J. Kim ^a

Korea University, Seoul, Korea

S. Cho, S. Choi ^a, Y. Go, D. Gyun, S. Ha, B. Hong, Y. Jo, Y. Kim, K. Lee, K. S. Lee, S. Lee, J. Lim, S. K. Park, Y. Roh

Seoul National University, Seoul, Korea

J. Almond, J. Kim, J. S. Kim, H. Lee, K. Lee, K. Nam, S. B. Oh, B. C. Radburn-Smith, S.h. Seo ^a, U. K. Yang, H. D. Yoo, G. B. Yu

University of Seoul, Seoul, Korea

H. Kim, J. H. Kim, J. S. H. Lee ^a, I. C. Park

Sungkyunkwan University, Suwon, Korea

Y. Choi, C. Hwang, J. Lee, I. Yu




Vilnius University, Vilnius, Lithuania

V. Dudenas, A. Juodagalvis, J. Vaitkus

National Centre for Particle Physics, Universiti Malaya, Kuala Lumpur, Malaysia

I. Ahmed, Z. A. Ibrahim, M. A. B. Md Ali³⁴, F. Mohamad Idris³⁵, W. A. T. Wan Abdullah, M. N. Yusli, Z. Zolkapli

Centro de Investigacion y de Estudios Avanzados del IPN, Mexico City, Mexico

Duran-Osuna, M. C., H. Castilla-Valdez, E. De La Cruz-Burelo ^a, Ramirez-Sanchez, G., I. Heredia-De La Cruz ³⁶, Rabadan-Trejo, R. I., R. Lopez-Fernandez, J. Mejia Guisao, Reyes-Almanza, R., A. Sanchez-Hernandez ^a

Universidad Iberoamericana, Mexico City, Mexico

S. Carrillo Moreno, C. Oropeza Barrera, F. Vazquez Valencia

Benemerita Universidad Autonoma de Puebla, Puebla, Mexico

J. Eysermans, I. Pedraza, H. A. Salazar Ibarguen, C. Uribe Estrada

Universidad Autónoma de San Luis Potosí, San Luis Potosí, Mexico

A. Morelos Pineda

University of Auckland, Auckland, New ZealandD. Krofcheck **University of Canterbury, Christchurch, New Zealand**










S. Bheesette, P. H. Butler

National Centre for Physics, Quaid-I-Azam University, Islamabad, Pakistan

A. Ahmad, M. Ahmad, Q. Hassan, H. R. Hoorani, A. Saddique, M. A. Shah, M. Shoaib, M. Waqas

National Centre for Nuclear Research, Swierk, Poland






H. Bialkowska, M. Bluj, B. Boimska, T. Frueboes, M. Górski, M. Kazana, K. Nawrocki, M. Szeleper, P. Traczyk, P. Zalewski

Institute of Experimental Physics, Faculty of Physics, University of Warsaw, Warsaw, PolandK. Bunkowski, A. Byszuk³⁷, K. Doroba, A. Kalinowski, M. Konecki , J. Krolikowski, M. Misiura, M. Olszewski, A. Pyskir, M. Walczak**Laboratório de Instrumentação e Física Experimental de Partículas, Lisbon, Portugal**P. Bargassa , C. Beirão Da Cruz E Silva , A. Di Francesco , P. Faccioli , B. Galinhas, M. Gallinaro, J. Hollar, N. Leonardo , L. Lloret Iglesias , M. V. Nemallapudi, J. Seixas , G. Strong, O. Toldaiev, D. Vadrucchio, J. Varela**Joint Institute for Nuclear Research, Dubna, Russia**A. Baginyan, I. Golutvin, A. Kamenev, V. Karjavin, V. Korenkov, G. Kozlov, A. Lanev, A. Malakhov, V. Matveev^{38,39}, V. V. Mitsyn, P. Moisenz, V. Palichik, V. Perelygin, S. Shmatov, V. Smirnov, V. Trofimov, B. S. Yuldashev⁴⁰, A. Zarubin, V. Zhiltsov**Petersburg Nuclear Physics Institute, Gatchina (St. Petersburg), Russia**Y. Ivanov, V. Kim⁴¹, E. Kuznetsova⁴², P. Levchenko , V. Murzin, V. Oreshkin, I. Smirnov, D. Sosnov, V. Sulimov, L. Uvarov, S. Vavilov, A. Vorobyev**Institute for Nuclear Research, Moscow, Russia**





Yu. Andreev, A. Dermenev, S. Gninenko, N. Golubev, A. Karneyeu, M. Kirsanov, N. Krasnikov, A. Pashenkov, D. Tlsov, A. Toropin

Institute for Theoretical and Experimental Physics, Moscow, Russia



































V. Epshteyn, V. Gavrilov, N. Lychkovskaya, V. Popov, I. Pozdnyakov, G. Safronov, A. Spiridonov, A. Stepenov, V. Stolin, M. Toms, E. Vlasov, A. Zhokin

Moscow Institute of Physics and Technology, Moscow, RussiaT. Aushev, A. Bylinkin **National Research Nuclear University 'Moscow Engineering Physics Institute' (MEPhI), Moscow, Russia**M. Chadeeva⁴³, P. Parygin, D. Philippov, S. Polikarpov , E. Popova, V. Rusinov**P.N. Lebedev Physical Institute, Moscow, Russia**V. Andreev, M. Azarkin³⁹, I. Dremin³⁹, M. Kirakosyan³⁹, S. V. Rusakov, A. Terkulov**Skobeltsyn Institute of Nuclear Physics, Lomonosov Moscow State University, Moscow, Russia**A. Baskakov, A. Belyaev, E. Boos , V. Bunichev, M. Dubinin⁴⁴, L. Dudko , V. Klyukhin, N. Korneeva, I. Lokhtin, I. Miagkov, S. Obraztsov, M. Perfilov, S. Petrushanko, V. Savrin, A. Snigirev **Novosibirsk State University (NSU), Novosibirsk, Russia**V. Blinov⁴⁵, D. Shtol , Y. Skovpen⁴⁵**State Research Center of Russian Federation, Institute for High Energy Physics of NRC 'Kurchatov Institute', Protvino, Russia**I. Azhgirey, I. Bayshev, S. Bitioukov , D. Elumakhov, A. Godizov, V. Kachanov, A. Kalinin, D. Konstantinov, P. Mandrik, V. Petrov, R. Ryutin, A. Sobol, S. Troshin, N. Tyurin, A. Uzunian, A. Volkov**National Research Tomsk Polytechnic University, Tomsk, Russia**

A. Babaev

University of Belgrade, Faculty of Physics and Vinca Institute of Nuclear Sciences, Belgrade, SerbiaP. Adzic⁴⁶, P. Cirkovic, D. Devetak, M. Dordevic, J. Milosevic **Centro de Investigaciones Energéticas Medioambientales y Tecnológicas (CIEMAT), Madrid, Spain**J. Alcaraz Maestre, A. Álvarez Fernández, I. Bachiller, M. Barrio Luna, M. Cerrada, N. Colino, B. De La Cruz, A. Delgado Peris, C. Fernandez Bedoya, J. P. Fernández Ramos , J. Flix , M. C. Fouz, O. Gonzalez Lopez, S. Goy Lopez, J. M. Hernandez, M. I. Josa, D. Moran, A. Pérez-Calero Yzquierdo, J. Puerta Pelayo, I. Redondo , L. Romero, M. S. Soares, A. Triossi**Universidad Autónoma de Madrid, Madrid, Spain**



C. Albajar, J. F. de Trocóniz

Universidad de Oviedo, Oviedo, SpainJ. Cuevas , C. Erice, J. Fernandez Menendez, S. Folgueras, I. Gonzalez Caballero , J. R. González Fernández, E. Palencia Cortezon, S. Sanchez Cruz , P. Vischia , J. M. Vizan Garcia **Instituto de Física de Cantabria (IFCA), CSIC-Universidad de Cantabria, Santander, Spain**I. J. Cabrillo, A. Calderon, B. Chazin Quero, J. Duarte Campderros, M. Fernandez , P. J. Fernández Manteca, A. García Alonso, J. Garcia-Ferrero, G. Gomez, A. Lopez Virto, J. Marco, C. Martinez Rivero, P. Martinez Ruiz del Arbol , F. Matorras, J. Piedra Gomez , C. Prieels, T. Rodrigo, A. Ruiz-Jimeno , L. Scodellaro , N. Trevisani, I. Vila, R. Vilar Cortabitarte**CERN, European Organization for Nuclear Research, Geneva, Switzerland**D. Abbaneo, B. Akgun, E. Auffray, P. Baillon, A. H. Ball, D. Barney, J. Bendavid, M. Bianco, A. Bocci, C. Botta, T. Camporesi, M. Cepeda , G. Cerminara, E. Chapon , Y. Chen, D. d'Enterria , A. Dabrowski, V. Daponte, A. David , M. De Gruttola, A. De Roeck, N. Deelen, M. Dobson, T. du Pree , M. Dünser, N. Dupont, A. Elliott-Peisert, P. Everaerts, F. Fallavollita⁴⁷, G. Franzoni, J. Fulcher , W. Funk, D. Gigi, A. Gilbert, K. Gill, F. Glege, D. Gulhan, J. Hegeman, V. Innocente, A. Jafari, P. Janot, O. Karacheban , J. Kieseler, V. Knünz , A. Kornmayer, M. Krammer¹, C. Lange , P. Lecoq, C. Lourenço, M. T. Lucchini , L. Malgeri, M. Mannelli, A. Martelli , F. Meijers, J. A. Merlin, S. Mersi, E. Meschi , P. Milenovic⁴⁸, F. Moortgat, M. Mulders, H. Neugebauer, J. Ngadiuba, S. Orfanelli, L. Orsini, F. Pantaleo , L. Pape, E. Perez, M. Peruzzi, A. Petrilli, G. Petrucciani, A. Pfeiffer, M. Pierini , F. M. Pitters, D. Rabady, A. Racz, T. Reis , G. Rolandi⁴⁹, M. Rovere, H. Sakulin, C. Schäfer, C. Schwick, M. Seidel, M. Selvaggi, A. Sharma, P. Silva , P. Sphicas⁵⁰, A. Stakia, J. Steggemann, M. Stoye, M. Tosi , D. Treille, A. Tsirou, V. Veckalns , M. Verweij, W. D. Zeuner**Paul Scherrer Institut, Villigen, Switzerland**W. Bertl[†], L. Caminada⁵², K. Deiters, W. Erdmann, R. Horisberger, Q. Ingram, H. C. Kaestli, D. Kotlinski, U. Langenegger, T. Rohe, S. A. Wiederkehr**ETH Zurich, Institute for Particle Physics and Astrophysics (IPA), Zurich, Switzerland**M. Backhaus, L. Bäni, P. Berger, B. Casal, N. Chernyavskaya, G. Dissertori, M. Dittmar, M. Donegà, C. Dorfer, C. Grab , C. Heidegger, D. Hits, J. Hoss, T. Klijnsma, W. Lustermann, M. Marionneau, M. T. Meinhard, D. Meister, F. Micheli, P. Musella , F. Nessi-Tedaldi, J. Pata, F. Pauss, G. Perrin, L. Perrozzi, M. Quittnat, M. Reichmann, D. Ruini, D. A. Sanz Becerra, M. Schönenberger, L. Shchutska , V. R. Tavolaro, K. Theofilatos, M. L. Vesterbacka Olsson, R. Wallny , D. H. Zhu**Universität Zürich, Zurich, Switzerland**T. K. Aarrestad, C. Amsler⁵³, D. Brzhechko, M. F. Canelli , A. De Cosa, R. Del Burgo, S. Donato , C. Galloni, T. Hreus, B. Kilminster , I. Neutelings, D. Pinna, G. Rauco, P. Robmann, D. Salerno , K. Schweiger, C. Seitz, Y. Takahashi, A. Zucchetta **National Central University, Chung-Li, Taiwan**Y. H. Chang, K. y. Cheng, T. H. Doan, Sh. Jain, R. Khurana, C. M. Kuo, W. Lin, A. Pozdnyakov , S. S. Yu**National Taiwan University (NTU), Taipei, Taiwan**P. Chang , Y. Chao, K. F. Chen, P. H. Chen, F. Fiori, W.-S. Hou, Y. Hsiung , Arun Kumar, Y. F. Liu, R.-S. Lu, E. Paganis, A. Psallidas, A. Steen, J. f. Tsai

Department of Physics, Faculty of Science, Chulalongkorn University, Bangkok, Thailand

B. Asavapibhop, K. Kovitangoon, G. Singh, N. Srimanobhas


Physics Department, Science and Art Faculty, Çukurova University, Adana, Turkey

A. Bat , F. Boran, S. Cerci⁵⁴, S. Damarseekin, Z. S. Demiroglu , C. Dozen, I. Dumanoglu, S. Girgis, G. Gokbulut, Y. Guler, I. Hos⁵⁵, E. E. Kangal⁵⁶, O. Kara, A. Kayis Topaksu, U. Kiminsu, M. Oglakci, G. Onengut, K. Ozdemir⁵⁷, D. Sunar Cerci⁵⁴, B. Tali⁵⁴, U. G. Tok, S. Turkcapar, I. S. Zorbakir, C. Zorbilmez

Physics Department, Middle East Technical University, Ankara, Turkey

G. Karapinar⁵⁸, K. Ocalan⁵⁹, M. Yalvac, M. Zeyrek

Bogazici University, Istanbul, Turkey

I. O. Atakisi, E. Gülmez, M. Kaya⁶⁰, O. Kaya⁶¹, S. Tekten, E. A. Yetkin 

Istanbul Technical University, Istanbul, Turkey

M. N. Agaras, S. Atay, A. Cakir, K. Cankocak, Y. Komurcu

Institute for Scintillation Materials of National Academy of Science of Ukraine, Kharkiv, Ukraine

B. Grynyov





National Scientific Center, Kharkov Institute of Physics and Technology, Kharkiv, Ukraine

L. Levchuk







University of Bristol, Bristol, UK

F. Ball, L. Beck, J. J. Brooke, D. Burns, E. Clement, D. Cussans, O. Davignon, H. Flacher , J. Goldstein , G. P. Heath, H. F. Heath , L. Kreczko, D. M. Newbold⁶³, S. Paramesvaran, T. Sakuma, S. Seif El Nasr-storey, D. Smith, V. J. Smith

Rutherford Appleton Laboratory, Didcot, UK

K. W. Bell, A. Belyaev , C. Brew, R. M. Brown, D. Cieri , D. J. A. Cockerill, J. A. Coughlan, K. Harder, S. Harper, J. Linacre , E. Olaiya, D. Petyt, C. H. Shepherd-Themistocleous, A. Thea , I. R. Tomalin, T. Williams, W. J. Womersley

Imperial College, London, UK

G. Auzinger, R. Bainbridge, P. Bloch, J. Borg, S. Breeze, O. Buchmuller, A. Bundock, S. Casasso , D. Colling, L. Corpe, P. Dauncey, G. Davies, M. Della Negra, R. Di Maria, Y. Haddad , G. Hall , G. Iles, T. James, M. Komm, R. Lane, C. Laner, L. Lyons, A.-M. Magnan, S. Malik, L. Mastrolorenzo, T. Matsushita, J. Nash⁶⁵, A. Nikitenko⁷, V. Palladino, M. Pesaresi, A. Richards, A. Rose, E. Scott, C. Seez, A. Shtipliyski, T. Strebler, S. Summers, A. Tapper , K. Uchida, M. Vazquez Acosta⁶⁶, T. Virdee , N. Wardle, D. Winterbottom, J. Wright, S. C. Zenz 

Brunel University, Uxbridge, UK

J. E. Cole, P. R. Hobson , A. Khan, P. Kyberd, A. Morton, I. D. Reid , L. Teodorescu, S. Zahid

Baylor University, Waco, USA

A. Borzou , K. Call, J. Dittmann, K. Hatakeyama, H. Liu, N. Pastika, C. Smith

Catholic University of America, Washington, DC, USA

R. Bartek , A. Dominguez 






The University of Alabama, Tuscaloosa, USA

A. Buccilli, S. I. Cooper, C. Henderson, P. Rumerio, C. West



Boston University, Boston, USA

D. Arcaro, A. Avetisyan, T. Bose, D. Gastler, D. Rankin, C. Richardson, J. Rohlf, L. Sulak, D. Zou

Brown University, Providence, USA

G. Benelli, D. Cutts, M. Hadley, J. Hakala, U. Heintz, J. M. Hogan , K. H. M. Kwok, E. Laird, G. Landsberg , J. Lee, Z. Mao, M. Narain, J. Pazzini , S. Piperov , S. Sagir, R. Syarif , D. Yu





University of California, Davis, Davis, USA

R. Band, C. Brainerd, R. Breedon, D. Burns, M. Calderon De La Barca Sanchez, M. Chertok, J. Conway , R. Conway, P. T. Cox, R. Erbacher, C. Flores, G. Funk, W. Ko, R. Lander, C. Mclean, M. Mulhearn, D. Pellett, J. Pilot, S. Shalhout, M. Shi, J. Smith, D. Stolp, D. Taylor, K. Tos, M. Tripathi , Z. Wang, F. Zhang





University of California, Los Angeles, USA

M. Bachtis, C. Bravo, R. Cousins , A. Dasgupta, A. Florent , J. Hauser , M. Ignatenko, N. Mccoll, S. Regnard, D. Saltzberg, C. Schnaible, V. Valuev


University of California, Riverside, Riverside, USA

E. Bouvier, K. Burt, R. Clare, J. Ellison, J. W. Gary , S. M. A. Ghiasi Shirazi, G. Hanson, G. Karapostoli, E. Kennedy, F. Lacroix , O. R. Long , M. Olmedo Negrete, M. I. Paneva, W. Si, L. Wang, H. Wei, S. Wimpenny, B. R. Yates 






University of California, San Diego, La Jolla, USA

J. G. Branson, S. Cittolin, M. Derdzinski, R. Gerosa , D. Gilbert, B. Hashemi, A. Holzner, D. Klein, G. Kole, V. Krutelyov , J. Letts, M. Masciovecchio, D. Olivito, S. Padhi, M. Pieri, M. Sani, V. Sharma , S. Simon, M. Tadel, A. Vartak, S. Wasserbaech ⁶⁸, J. Wood, F. Würthwein, A. Yagil , G. Zevi Della Porta

University of California, Santa Barbara - Department of Physics, Santa Barbara, USA

N. Amin, R. Bhandari, J. Bradmiller-Feld, C. Campagnari, M. Citron, A. Dishaw, V. Dutta, M. Franco Sevilla , L. Gouskos, R. Heller, J. Incandela, A. Ovcharova, H. Qu, J. Richman, D. Stuart, I. Suarez, J. Yoo


California Institute of Technology, Pasadena, USA

D. Anderson, A. Bornheim , J. Bunn, J. M. Lawhorn , H. B. Newman , T. Q. Nguyen, C. Pena , M. Spiropulu, J. R. Vlimant, R. Wilkinson, S. Xie, Z. Zhang, R. Y. Zhu 


Carnegie Mellon University, Pittsburgh, USA

M. B. Andrews, T. Ferguson, T. Mudholkar, M. Paulini , J. Russ, M. Sun, H. Vogel, I. Vorobiev, M. Weinberg
























University of Colorado Boulder, Boulder, USA

J. P. Cumalat, W. T. Ford , F. Jensen, A. Johnson, M. Krohn, S. Leontsinis, E. MacDonald, T. Mulholland, K. Stenson, K. A. Ulmer, S. R. Wagner





Cornell University, Ithaca, USA

J. Alexander, J. Chaves, Y. Cheng, J. Chu, A. Datta, K. Mcdermott, N. Mirman, J. R. Patterson, D. Quach, A. Rinkevicius, A. Ryd, L. Skinnari, L. Soffi, S. M. Tan, Z. Tao, J. Thom, J. Tucker, P. Wittich , M. Zientek

Fermi National Accelerator Laboratory, Batavia, USA

S. Abdullin, M. Albrow , M. Alyari, G. Apollinari, A. Apresyan, A. Apyan, S. Banerjee, L. A. T. Bauerick , A. Beretvas , J. Berryhill , P. C. Bhat, G. Bolla [†], K. Burkett , J. N. Butler, A. Canepa, G. B. Cerati, H. W. K. Cheung, F. Chlebana, M. Cremonesi, J. Duarte , V. D. Elvira , J. Freeman, Z. Gecse, E. Gottschalk, L. Gray, D. Green, S. Grünendahl , O. Gutsche , J. Hanlon, R. M. Harris , S. Hasegawa, J. Hirschauer , Z. Hu , B. Jayatilaka , S. Jindariani, M. Johnson, U. Joshi, B. Klima, M. J. Kortelainen, B. Kreis, S. Lammel, D. Lincoln , R. Lipton, M. Liu, T. Liu, R. Lopes De Sá, J. Lykken, K. Maeshima, N. Magini, J. M. Marraffino, D. Mason, P. McBride, P. Merkel, S. Mrenna , S. Nahn, V. O'Dell, K. Pedro , O. Prokofyev, G. Rakness, L. Ristori , A. Savoy-Navarro ⁶⁹, B. Schneider , E. Sexton-Kennedy, A. Soha, W. J. Spalding, L. Spiegel, S. Stoynev, J. Strait , N. Strobbe , L. Taylor, S. Tkaczyk, N. V. Tran, L. Uplegger , E. W. Vaandering, C. Vernieri, M. Verzocchi , R. Vidal, M. Wang , H. A. Weber, A. Whitbeck, W. Wu

University of Florida, Gainesville, USA

D. Acosta, P. Avery, P. Bortignon, D. Bourilkov , A. Brinkerhoff, A. Carnes, M. Carver , D. Curry, R. D. Field, I. K. Furic, S. V. Gleyzer, B. M. Joshi, J. Konigsberg, A. Korytov, K. Kotov, P. Ma, K. Matchev, H. Mei, G. Mitselmakher , K. Shi, D. Sperka, N. Terentyev, L. Thomas , J. Wang, S. Wang, J. Yelton

Florida International University, Miami, USA

Y. R. Joshi, S. Linn, P. Markowitz, J. L. Rodriguez


Florida State University, Tallahassee, USA

A. Ackert, T. Adams , A. Askew, S. Hagopian , V. Hagopian, K. F. Johnson, T. Kolberg, G. Martinez, T. Perry, H. Prosper, A. Saha, A. Santra, V. Sharma, R. Yohay 



Florida Institute of Technology, Melbourne, USA

M. M. Baarmand , V. Bhopatkar, S. Colafranceschi, M. Hohmann, D. Noonan, T. Roy, F. Yumiceva 



University of Illinois at Chicago (UIC), Chicago, USA

M. R. Adams, L. Apanasevich, D. Berry, R. R. Betts, R. Cavanaugh, X. Chen, S. Dittmer, O. Evdokimov, C. E. Gerber , D. A. Hangal, D. J. Hofman, K. Jung, J. Kamin, I. D. Sandoval Gonzalez, M. B. Tonjes, N. Varelas, H. Wang, Z. Wu, J. Zhang

The University of Iowa, Iowa City, USA

B. Bilki⁷⁰, W. Clarida, K. Dilsiz⁷¹, S. Durgut, R. P. Gandrajula, M. Haytmyradov, V. Khristenko, J.-P. Merlo, H. Mermerkaya⁷², A. Mestvirishvili, A. Moeller, J. Nachtman, H. Ogul , Y. Onel, F. Ozok⁷⁴, A. Penzo, C. Snyder, E. Tiras, J. Wetzel , K. Yi


Johns Hopkins University, Baltimore, USA

B. Blumenfeld , A. Cocoros, N. Eminizer, D. Fehling, L. Feng , A. V. Gritsan, W. T. Hung, P. Maksimovic, J. Roskes, U. Sarica, M. Swartz, M. Xiao, C. You

The University of Kansas, Lawrence, USA

A. Al-bataineh, P. Baringer , A. Bean , J. F. Benitez , S. Boren, J. Bowen, J. Castle, S. Khalil, A. Kropivnitskaya, D. Majumder , W. Mcbrayer, M. Murray, C. Rogan, C. Royon, S. Sanders, E. Schmitz, J. D. Tapia Takaki, Q. Wang 



Kansas State University, Manhattan, USA

A. Ivanov, K. Kaadze, Y. Maravin , A. Modak, A. Mohammadi, L. K. Saini, N. Skhirtladze








Lawrence Livermore National Laboratory, Livermore, USA

F. Rebassoo, D. Wright


University of Maryland, College Park, USA

A. Baden, O. Baron, A. Belloni, S. C. Eno , Y. Feng, C. Ferraioli, N. J. Hadley, S. Jabeen, G. Y. Jeng , R. G. Kellogg, J. Kunkle, A. C. Mignerey, F. Ricci-Tam, Y. H. Shin, A. Skuja, S. C. Tonwar

Massachusetts Institute of Technology, Cambridge, USA

D. Abercrombie, B. Allen, V. Azzolini, R. Barbieri , A. Baty , G. Bauer, R. Bi, S. Brandt, W. Busza, I. A. Cali, M. D'Alfonso, Z. Demiragli, G. Gomez Ceballos, M. Goncharov, P. Harris, D. Hsu, M. Hu, Y. Iiyama , G. M. Innocenti, M. Klute, D. Kovalskyi , Y.-J. Lee , A. Levin, P. D. Luckey, B. Maier, A. C. Marini , C. Mcginn, C. Mironov, S. Narayanan , X. Niu, C. Paus, C. Roland, G. Roland, G. S. F. Stephans, K. Sumorok, K. Tatar, D. Velicanu, J. Wang, T. W. Wang, B. Wyslouch, S. Zhaozhong

University of Minnesota, Minneapolis, USA

A. C. Benvenuti, R. M. Chatterjee, A. Evans, P. Hansen, S. Kalafut, Y. Kubota, Z. Lesko, J. Mans , S. Nourbakhsh, N. Ruckstuhl, R. Rusack, J. Turkewitz, M. A. Wadud


University of Mississippi, Oxford, USA

J. G. Acosta, S. Oliveros




University of Nebraska-Lincoln, Lincoln, USA

E. Avdeeva, K. Bloom , D. R. Claes, C. Fangmeier, F. Golf, R. Gonzalez Suarez , R. Kamalieddin, I. Kravchenko, J. Monroy, J. E. Siado, G. R. Snow, B. Stieger

State University of New York at Buffalo, Buffalo, USA

A. Godshalk, C. Harrington, I. Iashvili, D. Nguyen, A. Parker, S. Rappoccio , B. Roozbahani



Northeastern University, Boston, USA

G. Alverson , E. Barberis, C. Freer, A. Hortiangtham, A. Massironi, D. M. Morse , T. Orimoto, R. Teixeira De Lima, T. Wamorkar, B. Wang, A. Wisecarver, D. Wood 


Northwestern University, Evanston, USA

S. Bhattacharya, O. Charaf, K. A. Hahn, N. Mucia, N. Odell, M. H. Schmitt , K. Sung, M. Trovato, M. Velasco




University of Notre Dame, Notre Dame, USA

R. Bucci, N. Dev, M. Hildreth, K. Hurtado Anampa , C. Jessop, D. J. Karmgard, N. Kellams, K. Lannon, W. Li, N. Loukas, N. Marinelli, F. Meng, C. Mueller, Y. Musienko³⁸, M. Planer, A. Reinsvold , R. Ruchti, P. Siddireddy, G. Smith, S. Taroni, M. Wayne, A. Wightman, M. Wolf, A. Woodard

The Ohio State University, Columbus, USA

J. Alimena, L. Antonelli, B. Bylsma, L. S. Durkin, S. Flowers, B. Francis, A. Hart, C. Hill , W. Ji, T. Y. Ling, W. Luo, B. L. Winer, H. W. Wulsin



Princeton University, Princeton, USA

S. Cooperstein, O. Driga, P. Elmer , J. Hardenbrook, P. Hebda, S. Higginbotham, A. Kalogeropoulos, D. Lange, J. Luo, D. Marlow, K. Mei, I. Ojalvo, J. Olsen , C. Palmer, P. Piroué, J. Salfeld-Nebgen, D. Stickland, C. Tully 

University of Puerto Rico, Mayaguez, USA

S. Malik , S. Norberg



Purdue University, West Lafayette, USA

A. Barker, V. E. Barnes , S. Das, L. Gutay, M. Jones, A. W. Jung , A. Khatiwada, D. H. Miller, N. Neumeister, C. C. Peng, H. Qiu, J. F. Schulte, J. Sun, F. Wang, R. Xiao, W. Xie



Purdue University Northwest, Hammond, USA

T. Cheng, J. Dolen, N. Parashar

Rice University, Houston, USA

Z. Chen, K. M. Ecklund, S. Freed, F. J. M. Geurts , M. Guilbaud, M. Kilpatrick, W. Li, B. Michlin, B. P. Padley , J. Roberts, J. Rorie, W. Shi, Z. Tu, J. Zabel, A. Zhang







University of Rochester, Rochester, USA

A. Bodek , P. de Barbaro, R. Demina, Y. t. Duh, T. Ferbel, M. Galanti, A. Garcia-Bellido, J. Han , O. Hindrichs, A. Khukhunaishvili, K. H. Lo, P. Tan, M. Verzetti

The Rockefeller University, New York, USA

R. Ciesielski, K. Goulianos, C. Mesropian





Rutgers, The State University of New Jersey, Piscataway, USA

A. Agapitos, J. P. Chou, Y. Gershtein , T. A. Gómez Espinosa , E. Halkiadakis, M. Heindl, E. Hughes, S. Kaplan, R. Kunnawalkam Elayavalli , S. Kyriacou, A. Lath , R. Montalvo, K. Nash, M. Osherson, H. Saka , S. Salur, S. Schnetzer, D. Sheffield, S. Somalwar , R. Stone, S. Thomas, P. Thomassen, M. Walker



University of Tennessee, Knoxville, USA

A. G. Delannoy, J. Heideman, G. Riley, K. Rose, S. Spanier, K. Thapa


Texas A&M University, College Station, USA

O. Bouhali ⁷⁵, A. Castaneda Hernandez ⁷⁵, A. Celik, M. Dalchenko , M. De Mattia, A. Delgado, S. Dildick, R. Eusebi, J. Gilmore, T. Huang, T. Kamon ⁷⁶, R. Mueller, Y. Pakhotin, R. Patel, A. Perloff, L. Perniè , D. Rathjens , A. Safonov , A. Tatarinov



Texas Tech University, Lubbock, USA

N. Akchurin, J. Damgov, F. De Guio , P. R. Duerdo, J. Faulkner, E. Gурpinar, S. Kunori, K. Lamichhane, S. W. Lee, T. Mengke, S. Muthumuni, T. Peltola , S. Undleeb, I. Volobouev, Z. Wang


Vanderbilt University, Nashville, USA

S. Greene, A. Gurrola, R. Janjam, W. Johns, C. Maguire, A. Melo, H. Ni, K. Padeken, J. D. Ruiz Alvarez , P. Sheldon, S. Tuo, J. Velkovska, Q. Xu 

University of Virginia, Charlottesville, USA

M. W. Arenton, P. Barria , B. Cox, R. Hirosky, M. Joyce, A. Ledovskoy, H. Li, C. Neu , T. Sinthuprasith, Y. Wang, E. Wolfe, F. Xia

Wayne State University, Detroit, USA

R. Harr , P. E. Karchin, N. Poudyal, J. Sturdy, P. Thapa, S. Zaleski

University of Wisconsin - Madison, Madison, WI, USA

M. Brodski, J. Buchanan, C. Caillol, D. Carlsmith , S. Dasu, L. Dodd, S. Duric, B. Gomber, M. Grothe, M. Herndon,

A. Hervé, U. Hussain, P. Klabbbers, A. Lanaro, A. Levine, K. Long, R. Loveless, V. Rekovic, T. Ruggles, A. Savin, N. Smith, W. H. Smith, N. Woods

† **Deceased**

- 1: Also at Vienna University of Technology, Vienna, Austria
- 2: Also at IRFU, CEA, Université Paris-Saclay, Gif-sur-Yvette, France
- 3: Also at Universidade Estadual de Campinas, Campinas, Brazil
- 4: Also at Federal University of Rio Grande do Sul, Porto Alegre, Brazil
- 5: Also at Universidade Federal de Pelotas, Pelotas, Brazil
- 6: Also at Université Libre de Bruxelles, Bruxelles, Belgium
- 7: Also at Institute for Theoretical and Experimental Physics, Moscow, Russia
- 8: Also at Joint Institute for Nuclear Research, Dubna, Russia
- 9: Also at Fayoum University, El-Fayoum, Egypt
- 10: Now at British University in Egypt, Cairo, Egypt
- 11: Also at Zewail City of Science and Technology, Zewail, Egypt
- 12: Now at Ain Shams University, Cairo, Egypt
- 13: Now at RWTH Aachen University, III. Physikalisches Institut A, Aachen, Germany
- 14: Also at Department of Physics, King Abdulaziz University, Jeddah, Saudi Arabia
- 15: Also at Université de Haute Alsace, Mulhouse, France
- 16: Also at Skobeltsyn Institute of Nuclear Physics, Lomonosov Moscow State University, Moscow, Russia
- 17: Also at Tbilisi State University, Tbilisi, Georgia
- 18: Also at CERN, European Organization for Nuclear Research, Geneva, Switzerland
- 19: Also at University of Hamburg, Hamburg, Germany
- 20: Also at Brandenburg University of Technology, Cottbus, Germany
- 21: Also at Institute of Nuclear Research ATOMKI, Debrecen, Hungary
- 22: Also at MTA-ELTE Lendület CMS Particle and Nuclear Physics Group, Eötvös Loránd University, Budapest, Hungary
- 23: Also at Institute of Physics, University of Debrecen, Debrecen, Hungary
- 24: Also at Indian Institute of Technology Bhubaneswar, Bhubaneswar, India
- 25: Also at Institute of Physics, Bhubaneswar, India
- 26: Also at Shoolini University, Solan, India
- 27: Also at University of Visva-Bharati, Santiniketan, India
- 28: Also at University of Ruhuna, Matara, Sri Lanka
- 29: Also at Isfahan University of Technology, Isfahan, Iran
- 30: Also at Yazd University, Yazd, Iran
- 31: Also at Plasma Physics Research Center, Science and Research Branch, Islamic Azad University, Tehran, Iran
- 32: Also at Università degli Studi di Siena, Siena, Italy
- 33: Also at INFN Sezione di Milano-Bicocca^a, Università di Milano-Bicocca^b, Milano, Italy
- 34: Also at International Islamic University of Malaysia, Kuala Lumpur, Malaysia
- 35: Also at Malaysian Nuclear Agency, MOSTI, Kajang, Malaysia
- 36: Also at Consejo Nacional de Ciencia y Tecnología, Mexico city, Mexico
- 37: Also at Warsaw University of Technology, Institute of Electronic Systems, Warsaw, Poland
- 38: Also at Institute for Nuclear Research, Moscow, Russia
- 39: Now at National Research Nuclear University 'Moscow Engineering Physics Institute' (MEPhI), Moscow, Russia
- 40: Also at Institute of Nuclear Physics of the Uzbekistan Academy of Sciences, Tashkent, Uzbekistan
- 41: Also at St. Petersburg State Polytechnical University, St. Petersburg, Russia
- 42: Also at University of Florida, Gainesville, USA
- 43: Also at P.N. Lebedev Physical Institute, Moscow, Russia
- 44: Also at California Institute of Technology, Pasadena, USA
- 45: Also at Budker Institute of Nuclear Physics, Novosibirsk, Russia
- 46: Also at Faculty of Physics, University of Belgrade, Belgrade, Serbia
- 47: Also at INFN Sezione di Pavia^a, Università di Pavia^b, Pavia, Italy
- 48: Also at University of Belgrade, Faculty of Physics and Vinca Institute of Nuclear Sciences, Belgrade, Serbia
- 49: Also at Scuola Normale e Sezione dell'INFN, Pisa, Italy

- 50: Also at National and Kapodistrian University of Athens, Athens, Greece
51: Also at Riga Technical University, Riga, Latvia
52: Also at Universität Zürich, Zurich, Switzerland
53: Also at Stefan Meyer Institute for Subatomic Physics (SMI), Vienna, Austria
54: Also at Adiyaman University, Adiyaman, Turkey
55: Also at Istanbul Aydin University, Istanbul, Turkey
56: Also at Mersin University, Mersin, Turkey
57: Also at Piri Reis University, Istanbul, Turkey
58: Also at Izmir Institute of Technology, Izmir, Turkey
59: Also at Necmettin Erbakan University, Konya, Turkey
60: Also at Marmara University, Istanbul, Turkey
61: Also at Kafkas University, Kars, Turkey
62: Also at Istanbul Bilgi University, Istanbul, Turkey
63: Also at Rutherford Appleton Laboratory, Didcot, United Kingdom
64: Also at School of Physics and Astronomy, University of Southampton, Southampton, United Kingdom
65: Also at Monash University, Faculty of Science, Clayton, Australia
66: Also at Instituto de Astrofísica de Canarias, La Laguna, Spain
67: Also at Bethel University, St. Paul, USA
68: Also at Utah Valley University, Orem, USA
69: Also at Purdue University, West Lafayette, USA
70: Also at Beykent University, Istanbul, Turkey
71: Also at Bingol University, Bingol, Turkey
72: Also at Erzincan University, Erzincan, Turkey
73: Also at Sinop University, Sinop, Turkey
74: Also at Mimar Sinan University, Istanbul, Istanbul, Turkey
75: Also at Texas A&M University at Qatar, Doha, Qatar
76: Also at Kyungpook National University, Daegu, Korea