



Erratum to: Measurement of exclusive Υ photoproduction from protons in pPb collisions at $\sqrt{s_{NN}} = 5.02$ TeV

CMS Collaboration*

CERN, 1211 Geneva 23, Switzerland

Published online: 20 April 2022

© CERN for the benefit of the CMS collaboration 2022

Erratum to: Eur. Phys. J. C (2019) 79:277

<https://doi.org/10.1140/epjc/s10052-019-6774-8>

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/s10052-019-6774-8>.

* 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. Grossmann, J. Hrubec, M. Jeitler¹,
A. König , N. Krammer, I. Krätschmer , D. Liko, T. Madlener, I. Mikulec, E. Pree, 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, Antwerpen, Belgium

E. 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, Brazil

W. 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, L. 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, China

W. 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, P. M. Ribeiro Cipriano, T. Sculac

Faculty of Science, University of Split, 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

S. Khalil⁹, M. A. Mahmoud ,^{10,11} Y. Mohammed ¹⁰

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. Dejardin, D. Denegri, J. L. Faure, F. Ferri , S. Ganjour, S. Ghosh, A. Givernaud, P. Gras, G. Hamel de Monchenault , P. Jarry, C. LeLoup, E. Locci, M. Machet, 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. Abdulsalam¹², 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, Strasbourg, France

J.-L. Agram ¹³, J. Andrea, D. Bloch, J.-M. Brom, E. C. Chabert, C. Collard, E. Conte¹³, X. Coubez, F. Drouhin¹³, J.-C. Fontaine¹³, 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. Finco , 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. Popov ¹⁴, V. Sordini, M. Vander Donckt, S. Viret, S. Zhang

Georgian Technical University, Tbilisi, Georgia

T. Toriashvili¹⁵

Tbilisi State University, Tbilisi, Georgia

Z. Tsamalaidze⁸

I. Physikalisches Institut, RWTH Aachen University, 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. Zhukov¹⁴

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

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

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

G. Flügge, B. Kargoll, T. Kress, A. Künsken, T. Müller, A. Nehr Korn, A. Nowack, C. Pistone, O. Pooth, A. Stahl ¹⁶

Deutsches Elektronen-Synchrotron, Hamburg, Germany

M. Aldaya Martin, T. Arndt, C. Asawatangkuldee, K. Beernaert, O. Behnke, U. Behrens, A. Bermúdez Martínez, A. A. Bin Anuar, K. Borras¹⁷, 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. Elwood , E. Eren, E. Gallo¹⁸, J. Garay Garcia, A. Geiser, J. M. Grados Luyando, A. Grohsjean , P. Gunnellini, M. Guthoff, A. Harb, J. Hauk, M. Hempel¹⁹, H. Jung, M. Kasemann , J. Keaveney, C. Kleinwort, J. Knolle, I. Korol, D. Krücker, W. Lange, A. Lelek, T. Lenz, K. Lipka, W. Lohmann¹⁹, R. Mankel, I.-A. Melzer-Pellmann, A. B. Meyer, M. Meyer, M. Missiroli , G. Mittag, J. Mnich, A. Mussgiller, D. Pitzl, A. Raspereza, M. Savitskyi, P. Saxena, R. Shevchenko, N. Stefaniuk, H. Tholen, G. P. Van Onsem, R. Walsh, Y. Wen , K. Wichmann, C. Wissing, O. Zenaiev

University of Hamburg, Hamburg, Germany

R. Aggleton, S. Bein, V. Blobel, M. Centis Vignali, T. Dreyer, E. Garutti , D. Gonzalez, J. Haller, A. Hinzmann, M. Hoffmann, A. Karavdina, G. Kasieczka, R. Klanner , 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. Scharf , P. Schleper, A. Schmidt , S. Schumann, J. Schwandt , J. Sonneveld, H. Stadie, G. Steinbrück, F. M. Stober , M. Stöver, D. Troendle, E. Usai, A. Vanhoefer, B. Vormwald 

Karlsruher Institut fuer Technologie, 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. Hartmann¹⁶, S. M. Heindl, U. Husemann , F. Kassel¹⁶, 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. Ulrich , 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. Gerasis, 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, Ioannina, Greece

I. Evangelou, C. Foudas, P. Gianneios, 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, HungaryM. Csanad , N. Filipovic, G. Pasztor , O. Surányi, G. I. Veres ²⁰**Wigner Research Centre for Physics, Budapest, Hungary**G. Bencze, C. Hajdu, D. Horvath²¹, Á. Hunyadi, F. Sikler, T. Á. Vámi, V. Veszpremi, G. Vesztergombi²⁰**Institute of Nuclear Research ATOMKI, Debrecen, Hungary**N. Beni, S. Czellar, J. Karancsi²², 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, HBNI, Bhubaneswar, India**S. Bahinipati²³, P. Mal, K. Mandal, A. Nayak²⁴, D. K. Sahoo²³, 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, IndiaA. 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. Bhardwaj²⁵, R. Bhattacharya, S. Bhattacharya, U. Bhawandeep²⁵, D. Bhowmik, S. Dey, S. Dutt²⁵, 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. Thakur²⁵**Indian Institute of Technology Madras, Madras, India**

P. K. Behera

Bhabha Atomic Research Centre, Mumbai, IndiaR. Chudasama, D. Dutta, V. Jha, V. Kumar, A. K. Mohanty¹⁶, 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. Maity²⁶, G. Majumder, K. Mazumdar, N. Sahoo, T. Sarkar²⁶, N. Wickramage²⁷**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. Chenarani²⁸, E. Eskandari Tadavani , S. M. Etesami²⁸, M. Khakzad, M. Mohammadi Najafabadi , M. Naseri, S. Paktinat Mehdiabadi²⁹, F. Rezaei Hosseinabadi, B. Safarzadeh³⁰, 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 ,¹⁶ R. Venditti , P. Verwilligen , G. Zito 

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

G. Abbiendi , C. Battilana , D. Bonacorsi , L. Borghoni , S. Braibant-Giacomelli , 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 ,
 S. Marcellini , G. Masetti , A. Montanari , F. L. Navarria , F. Odorici , A. Perrotta , A. M. Rossi ,
 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, Firenze, Italy

G. Barbagli , K. Chatterjee , V. Ciulli , C. Civinini , R. D'Alessandro , E. Focardi , G. Latino,
 P. Lenzi , M. Meschini , S. Paoletti , L. Russo ,³¹ G. Sguazzoni , D. Strom , L. Viliani 

INFN Laboratori Nazionali di Frascati, Frascati, Italy

L. Benussi , S. Bianco , F. Fabbri, D. Piccolo , F. Primavera ,¹⁶

INFN Sezione di Genova^a, Università di Genova^b, Genoa, Italy

V. Calvelli , F. Ferro , F. Ravera , E. Robutti , S. Tosi 

INFN Sezione di Milano-Bicocca^a, Università di Milano-Bicocca^b, Milan, Italy

A. Benaglia , A. Beschi , L. Brianza , F. Brivio , V. Ciriolo ,¹⁶ 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 ,³² S. Ragazzi ,
 T. Tabarelli de Fatis 

INFN Sezione di Napoli^a, Università di Napoli 'Federico II'^b, Napoli, Italy, Università della Basilicata^c, Potenza, Italy, Università G. Marconi^d, Rome, Italy

S. Buontempo , N. Cavallo , S. Di Guida ,¹⁶ F. Fabozzi , F. Fienga , G. Galati , A. O. M. Iorio ,
 W. A. Khan , L. Lista , S. Meola ,¹⁶ P. Paolucci ,¹⁶ C. Sciacca , F. Thyssen , E. Voevodina 

INFN Sezione di Padova^a, Università di Padova^b, Padova, Italy, Università di Trento^c, Trento, Italy

P. Azzi , N. Bacchetta , L. Benato , D. Bisello , A. Boletti , R. Carlin ,
 A. Carvalho Antunes De Oliveira , P. Checchia , P. De Castro Manzano , T. Dorigo , U. Dosselli ,
 F. Gasparini , U. Gasparini , A. Gozzelino , S. Lacaprara , P. Lujan , M. Margoni ,
 A. T. Meneguzzo , N. Pozzobon , P. Ronchese , R. Rossin , F. Simonetto , A. Tiko, M. Zanetti ,
 P. Zotto , G. Zumerle 

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 ,¹⁶ G. Bagliesi , L. Bianchini , T. Boccali , L. Borrello , R. Castaldi ,
 M. A. Ciocci , R. Dell'Orso , G. Fedi , L. Giannini , A. Giassi , M. T. Grippo ,³¹ 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. Verдини ^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, M. Casarsa ^a, F. Cossutti ^a, G. Della Ricca ^{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. Dudenias, A. Juodagalvis, J. Vaitkus

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

I. Ahmed, Z. A. Ibrahim, M. A. B. Md Ali³³, F. Mohamad Idris³⁴, W. A. T. Wan Abdullah, M. N. Yusli, Z. Zolkapli

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

H. Castilla-Valdez, E. De La Cruz-Burelo ^a, M. C. Duran-Osuna, I. Heredia-De La Cruz ^{a,35}, R. Lopez-Fernandez, J. Mejia Guisao, R. I. Rabadan-Trejo, G. Ramirez-Sanchez, R. Reyes-Almanza, 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. Szleper, P. Traczyk, P. Zalewski

Institute of Experimental Physics, Faculty of Physics, University of Warsaw, Warsaw, PolandK. Bunkowski, A. Byszek³⁶, 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. Vadrucio, J. Varela**Joint Institute for Nuclear Research, Dubna, Russia**S. Afanasiev, P. Bunin, M. Gavrilenko, I. Golutvin, I. Gorbunov, A. Kamenev, V. Karjavin, A. Lanev, A. Malakhov, V. Matveev^{37,38}, P. Moisenz, V. Palichik, V. Perelygin, S. Shmatov, S. Shulha, N. Skatchkov, V. Smirnov, N. Voytishin, A. Zarubin**Petersburg Nuclear Physics Institute, Gatchina (St. Petersburg), Russia**Y. Ivanov, V. Kim³⁹, E. Kuznetsova⁴⁰, 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. Karneyev, M. Kirsanov, N. Krasnikov, A. Pashenkov, D. Tlisov, 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 ³⁸**P.N. Lebedev Physical Institute, Moscow, Russia**V. Andreev, M. Azarkin³⁸, I. Dremin³⁸, M. Kirakosyan³⁸, S. V. Rusakov, A. Terkulov**Skobeltsyn Institute of Nuclear Physics, Lomonosov Moscow State University, Moscow, Russia**A. Baskakov, A. Belyaev, E. Boos , A. Ershov, A. Gribushin, L. Khein, V. Klyukhin, O. Kodolova, I. Lokhtin, O. Lukina, I. Miagkov, S. Obraztsov, S. Petrushanko, V. Savrin, A. Snigirev **Novosibirsk State University (NSU), Novosibirsk, Russia**V. Blinov⁴¹, D. Shtol ⁴¹, Y. Skovpen⁴¹**Institute for High Energy Physics of National Research Centre ‘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

Faculty of Physics and Vinca Institute of Nuclear Sciences, University of Belgrade, Belgrade, SerbiaP. Adzic⁴², 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, Spain

J. 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. Vizán García 

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. Fallavollita ⁴³, 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. Krammer ¹, 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. Milenovic ⁴⁴, 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. Rabad, A. Racz, T. Reis , G. Rolandi ⁴⁵, M. Rovere, H. Sakulin, C. Schäfer, C. Schwick, M. Seidel, M. Selvaggi, A. Sharma, P. Silva , P. Sphicas ⁴⁶, A. Stakia, J. Steggemann, M. Stoye, M. Tosi , D. Treille, A. Tsiros, V. Veckalns , M. Verweij, W. D. Zeuner

Paul Scherrer Institut, Villigen, Switzerland

W. Bertl [†], L. Caminada ⁴⁸, 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. Klijsma, 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. Amsler ⁴⁹, 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

V. Candelise , 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. Kovitanggoon, G. Singh, N. Srimanobhas

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

A. Bat , F. Boran, S. Cerci⁵⁰, S. Damarseckin, Z.S. Demiroglu , C. Dozen, I. Dumanoglu, S. Girgis, G. Gokbulut, Y. Guler, I. Hos⁵¹, E. E. Kangal⁵², O. Kara, U. Kiminsu, M. Oglakci, G. Onengut, K. Ozdemir⁵³, D. Sunar Cerci⁵⁰, B. Tali⁵⁰, U. G. Tok, H. Topakli⁵⁴, S. Turkcapar, I. S. Zorbakir, C. Zorbilmez

Physics Department, Middle East Technical University, Ankara, Turkey

G. Karapinar⁵⁵, K. Ocalan⁵⁶, M. Yalvac, M. Zeyrek

Bogazici University, Istanbul, Turkey

I. O. Atakisi, E. Gülmez, M. Kaya⁵⁷, O. Kaya⁵⁸, S. Tekten, E.A. Yetkin ⁵⁹

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, Kharkov, Ukraine

B. Grynyov

National Scientific Center, Kharkov Institute of Physics and Technology, Kharkov, 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. Newbold⁶⁰, S. Paramesvaran, T. Sakuma, S. Seif El Nasr-storey, D. Smith, V. J. Smith

Rutherford Appleton Laboratory, Didcot, UK

K. W. Bell, A. Belyaev ⁶¹, 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. Nash⁶², A. Nikitenko⁷, V. Palladino, M. Pesaresi, A. Richards, A. Rose, E. Scott, C. Seez, A. Shtiplyski, T. Strebler, S. Summers, A. Tapper , K. Uchida, M. Vazquez Acosta⁶³, T. Virdee ¹⁶, 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 ⁶⁴, 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 ⁶⁵, J. Wood, F. Würthwein, A. Yagil , G. Zevi Della Porta

Department of Physics, University of California, Santa Barbara, 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. Bauerdick , 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. Gece, 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 ⁶⁶, 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. Bilki⁶⁷, W. Clarida, K. Dilsiz⁶⁸, S. Durgut, R. P. Gandrajula, M. Haytmyradov, V. Khristenko, J.-P. Merlo, H. Mermerkaya⁶⁹, A. Mestvirishvili, A. Moeller, J. Nachtman, H. Ogul , Y. Onel, F. Ozok⁷¹, 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 , 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. Musienko³⁷, 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 ⁷², A. Castaneda Hernandez ⁷², A. Celik, M. Dalchenko , M. De Mattia, A. Delgado, S. Dildick, R. Eusebi, J. Gilmore, T. Huang, T. Kamon ⁷³, 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. Gurpinar, 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. Klabbers, 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, Brussels, 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 Zewail City of Science and Technology, Zewail, Egypt
- 10: Also at Fayoum University, El-Fayoum, Egypt
- 11: Now at British University in Egypt, Cairo, Egypt
- 12: Also at Department of Physics, King Abdulaziz University, Jeddah, Saudi Arabia
- 13: Also at Université de Haute Alsace, Mulhouse, France
- 14: Also at Skobeltsyn Institute of Nuclear Physics, Lomonosov Moscow State University, Moscow, Russia
- 15: Also at Tbilisi State University, Tbilisi, Georgia
- 16: Also at CERN, European Organization for Nuclear Research, Geneva, Switzerland
- 17: Also at III. Physikalisches Institut A, RWTH Aachen University, Aachen, Germany
- 18: Also at University of Hamburg, Hamburg, Germany
- 19: Also at Brandenburg University of Technology, Cottbus, Germany
- 20: Also at MTA-ELTE Lendület CMS Particle and Nuclear Physics Group, Eötvös Loránd University, Budapest, Hungary
- 21: Also at Institute of Nuclear Research ATOMKI, Debrecen, Hungary
- 22: Also at Institute of Physics, University of Debrecen, Debrecen, Hungary
- 23: Also at Indian Institute of Technology Bhubaneswar, Bhubaneswar, India
- 24: Also at Institute of Physics, Bhubaneswar, India
- 25: Also at Shoolini University, Solan, India
- 26: Also at University of Visva-Bharati, Santiniketan, India
- 27: Also at University of Ruhuna, Matara, Sri Lanka
- 28: Also at Isfahan University of Technology, Isfahan, Iran
- 29: Also at Yazd University, Yazd, Iran
- 30: Also at Plasma Physics Research Center, Science and Research Branch, Islamic Azad University, Tehran, Iran
- 31: Also at Università degli Studi di Siena, Siena, Italy
- 32: Università di Milano-Bicocca ^b, Milan, Italy
- 33: Also at International Islamic University of Malaysia, Kuala Lumpur, Malaysia
- 34: Also at Malaysian Nuclear Agency, MOSTI, Kajang, Malaysia
- 35: Also at Consejo Nacional de Ciencia y Tecnología, Mexico City, Mexico
- 36: Also at Institute of Electronic Systems, Warsaw University of Technology, Warsaw, Poland
- 37: Also at Institute for Nuclear Research, Moscow, Russia
- 38: Now at National Research Nuclear University 'Moscow Engineering Physics Institute' (MEPhI), Moscow, Russia
- 39: Also at St. Petersburg State Polytechnical University, St. Petersburg, Russia
- 40: Also at University of Florida, Gainesville, USA
- 41: Also at Budker Institute of Nuclear Physics, Novosibirsk, Russia
- 42: Also at Faculty of Physics, University of Belgrade, Belgrade, Serbia
- 43: Università di Pavia ^b, Pavia, Italy
- 44: Also at Faculty of Physics and Vinca Institute of Nuclear Sciences, University of Belgrade, Belgrade, Serbia
- 45: Also at Scuola Normale e Sezione dell'INFN, Pisa, Italy
- 46: Also at National and Kapodistrian University of Athens, Athens, Greece
- 47: Also at Riga Technical University, Riga, Latvia
- 48: Also at Universität Zürich, Zurich, Switzerland
- 49: Also at Stefan Meyer Institute for Subatomic Physics (SMI), Vienna, Austria

- 50: Also at Adiyaman University, Adiyaman, Turkey
- 51: Also at Istanbul Aydin University, Istanbul, Turkey
- 52: Also at Mersin University, Mersin, Turkey
- 53: Also at Piri Reis University, Istanbul, Turkey
- 54: Also at Gaziosmanpasa University, Tokat, Turkey
- 55: Also at Izmir Institute of Technology, Izmir, Turkey
- 56: Also at Necmettin Erbakan University, Konya, Turkey
- 57: Also at Marmara University, Istanbul, Turkey
- 58: Also at Kafkas University, Kars, Turkey
- 59: Also at Istanbul Bilgi University, Istanbul, Turkey
- 60: Also at Rutherford Appleton Laboratory, Didcot, UK
- 61: Also at School of Physics and Astronomy, University of Southampton, Southampton, UK
- 62: Also at Faculty of Science, Monash University, Clayton, Australia
- 63: Also at Instituto de Astrofísica de Canarias, La Laguna, Spain
- 64: Also at Bethel University, St. Paul, USA
- 65: Also at Utah Valley University, Orem, USA
- 66: Also at Purdue University, West Lafayette, USA
- 67: Also at Beykent University, Istanbul, Turkey
- 68: Also at Bingol University, Bingol, Turkey
- 69: Also at Erzincan University, Erzincan, Turkey
- 70: Also at Sinop University, Sinop, Turkey
- 71: Also at Mimar Sinan University, Istanbul, Istanbul, Turkey
- 72: Also at Texas A&M University at Qatar, Doha, Qatar
- 73: Also at Kyungpook National University, Daegu, Korea