

CMS author list

Yerevan Physics Institute, Yerevan, Armenia

A. Hayrapetyan, V. Makarenko , A. Tumasyan¹ 

Institut für Hochenergiephysik, Vienna, Austria

W. Adam , J.W. Andrejkovic, L. Benato , T. Bergauer , K. Damanakis , M. Dragicevic , C. Gior-
dano, P.S. Hussain , M. Jeitler² , N. Krammer , A. Li , D. Liko , I. Mikulec , J. Schieck² ,
R. Schöfbeck² , D. Schwarz , M. Shoohtari, M. Sonawane , W. Waltenberger , C.-E. Wulz² 

Universiteit Antwerpen, Antwerpen, Belgium

T. Janssen , H. Kwon , D. Ocampo Henao, T. Van Laer, P. Van Mechelen 

Vrije Universiteit Brussel, Brussel, Belgium

J. Bierkens , N. Breugelmans, J. D'Hondt , S. Dansana , A. De Moor , M. Delcourt , F. Heyen,
Y. Hong , P. Kashko, S. Lowette , I. Makarenko , D. Müller , J. Song , S. Tavernier ,
M. Tytgat³ , G.P. Van Onsem , S. Van Putte , D. Vannerom 

Université Libre de Bruxelles, Bruxelles, Belgium

B. Bilin , B. Clerbaux , A.K. Das, I. De Bruyn , G. De Lentdecker , H. Evard , L. Favart ,
P. Giannios , A. Khalilzadeh, F.A. Khan , A. Malara , M.A. Shahzad, L. Thomas , M. Van-
den Bemden , C. Vander Velde , P. Vanlaer , F. Zhang 

Ghent University, Ghent, Belgium

M. De Coen , D. Dobur , G. Gokbulut , J. Knolle , L. Lambrecht , D. Marckx , K. Skovpen ,
N. Van Den Bossche , J. van der Linden , J. Vandenbroeck , L. Wezenbeek 

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

S. Bein , A. Benecke , A. Bethani , G. Bruno , A. Cappati , J. De Favereau De Jeneret , C. De-
laere , A. Giammanco , A.O. Guzel , V. Lemaitre, J. Lidrych , P. Malek , P. Mastrapasqua ,
S. Tentori , S. Turkcapar 

Centro Brasileiro de Pesquisas Fisicas, Rio de Janeiro, Brazil

G.A. Alves , M. Barroso Ferreira Filho , E. Coelho , C. Hensel , T. Menezes De Oliveira ,
C. Mora Herrera⁴ , P. Rebello Teles , M. Soeiro, E.J. Tonelli Manganote⁵ , A. Vilela Pereira⁴ 

Universidade do Estado do Rio de Janeiro, Rio de Janeiro, Brazil

W.L. Aldá Júnior , H. Brandao Malbouisson , W. Carvalho , J. Chinellato⁶, M. Costa Reis ,
E.M. Da Costa , G.G. Da Silveira⁷ , D. De Jesus Damiao , S. Fonseca De Souza ,
R. Gomes De Souza, S. S. Jesus , T. Laux Kuhn⁷ , M. Macedo , K. Mota Amarilo ,
L. Mundim , H. Nogima , J.P. Pinheiro , A. Santoro , A. Sznajder , M. Thiel , F. Tor-
res Da Silva De Araujo⁸ 

Universidade Estadual Paulista, Universidade Federal do ABC, São Paulo, Brazil

C.A. Bernardes⁷ , T.R. Fernandez Perez Tomei , E.M. Gregores , B. Lopes Da Costa, I. Maietto Sil-
verio , P.G. Mercadante , S.F. Novaes , B. Orzari , Sandra S. Padula , V. Scheurer

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

A. Aleksandrov , G. Antchev , P. Danev, R. Hadjiiska , P. Iaydjiev , M. Misheva , M. Shopova ,
G. Sultanov 

University of Sofia, Sofia, Bulgaria

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

Instituto De Alta Investigación, Universidad de Tarapacá, Casilla 7 D, Arica, Chile

S. Keshri , D. Laroze , S. Thakur 

Universidad Técnica Federico Santa María, Valparaiso, Chile

W. Brooks 

Beihang University, Beijing, China

T. Cheng , T. Javaid , L. Wang , L. Yuan 

Department of Physics, Tsinghua University, Beijing, China

Z. Hu , Z. Liang, J. Liu, X. Wang 

Institute of High Energy Physics, Beijing, China

G.M. Chen⁹ , H.S. Chen⁹ , M. Chen⁹ , Y. Chen , Q. Hou , X. Hou, F. Iemmi , C.H. Jiang, A. Kapoor¹⁰ , H. Liao , G. Liu , Z.-A. Liu¹¹ , J.N. Song¹¹, S. Song, J. Tao , C. Wang⁹, J. Wang , H. Zhang , J. Zhao 

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

A. Agapitos , Y. Ban , A. Carvalho Antunes De Oliveira , S. Deng , B. Guo, Q. Guo, C. Jiang , A. Levin , C. Li , Q. Li , Y. Mao, S. Qian, S.J. Qian , X. Qin, X. Sun , D. Wang , J. Wang, H. Yang, M. Zhang, Y. Zhao, C. Zhou 

Guangdong Provincial Key Laboratory of Nuclear Science and Guangdong-Hong Kong Joint Laboratory of Quantum Matter, South China Normal University, Guangzhou, China

S. Yang 

Sun Yat-Sen University, Guangzhou, China

Z. You 

University of Science and Technology of China, Hefei, China

K. Jaffel , N. Lu 

Nanjing Normal University, Nanjing, China

G. Bauer¹², B. Li¹³, H. Wang , K. Yi¹⁴ , J. Zhang 

Institute of Modern Physics and Key Laboratory of Nuclear Physics and Ion-beam Application (MOE) - Fudan University, Shanghai, China

Y. Li

Zhejiang University, Hangzhou, Zhejiang, China

Z. Lin , C. Lu , M. Xiao¹⁵ 

Universidad de Los Andes, Bogota, Colombia

C. Avila , D.A. Barbosa Trujillo, A. Cabrera , C. Florez , J. Fraga , J.A. Reyes Vega

Universidad de Antioquia, Medellin, Colombia

C. Rendón , M. Rodriguez , A.A. Ruales Barbosa , J.D. Ruiz Alvarez 

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

N. Godinovic , D. Lelas , A. Sculac 

University of Split, Faculty of Science, Split, Croatia

M. Kovac , A. Petkovic , T. Sculac 

Institute Rudjer Boskovic, Zagreb, Croatia

P. Bargassa , V. Brigljevic , B.K. Chitroda , D. Ferencek , K. Jakovic, A. Starodumov , T. Susa 

University of Cyprus, Nicosia, Cyprus

A. Attikis , K. Christoforou , A. Hadjiagapiou, C. Leonidou , C. Nicolaou, L. Paizanos, F. Ptochos , P.A. Razis , H. Rykaczewski, H. Saka , A. Stepennov 

Charles University, Prague, Czech Republic

M. Finger[†] , M. Finger Jr. , A. Kveton 

Escuela Politecnica Nacional, Quito, Ecuador

E. Ayala 

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

Y. Assran^{16,17}, B. El-mahdy¹⁸ 

Center for High Energy Physics (CHEP-FU), Fayoum University, El-Fayoum, Egypt

M. Abdullah Al-Mashad , A. Hussein, H. Mohammed 

National Institute of Chemical Physics and Biophysics, Tallinn, Estonia

K. Ehataht , M. Kadastik, T. Lange , C. Nielsen , J. Pata , M. Raidal , N. Seeba , L. Tani 

Department of Physics, University of Helsinki, Helsinki, Finland

A. Milieva, K. Osterberg , M. Voutilainen 

Helsinki Institute of Physics, Helsinki, Finland

N. Bin Norjoharuddeen , E. Brücken , F. Garcia , P. Inkaew , K.T.S. Kallonen , R. Kumar Verma , T. Lampén , K. Lassila-Perini , B. Lehtela, S. Lehti , T. Lindén , N.R. Mancilla Xinto, M. Myllymäki , M.m. Rantanen , S. Saariokari , N.T. Toikka , J. Tuominiemi 

Lappeenranta-Lahti University of Technology, Lappeenranta, Finland

H. Kirschenmann , P. Luukka , H. Petrow 

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

M. Besancon , F. Couderc , M. Dejardin , D. Denegri, P. Devouge, J.L. Faure, F. Ferri , S. Ganjour , P. Gras , G. Hamel de Monchenault , M. Kumar , V. Lohezic , J. Malcles , F. Orlandi , L. Portales , S. Ronchi, M.Ö. Sahin , A. Savoy-Navarro¹⁹ , P. Simkina , M. Titov , M. Tornago 

Laboratoire Leprince-Ringuet, CNRS/IN2P3, Ecole Polytechnique, Institut Polytechnique de Paris, Palaiseau, France

F. Beaudette , G. Boldrini , P. Busson , C. Charlot , M. Chiusi , T.D. Cuisset , F. Damas , O. Davignon , A. De Wit , T. Debnath , I.T. Ehle , B.A. Fontana Santos Alves , S. Ghosh , A. Gilbert , R. Granier de Cassagnac , L. Kalipoliti , M. Manoni , M. Nguyen , S. Obraztsov , C. Ochando , R. Salerno , J.B. Sauvan , Y. Sirois , G. Sokmen, L. Urda Gómez , A. Zabi , A. Zghiche 

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

J.-L. Agram²⁰ , J. Andrea , D. Bloch , J.-M. Brom , E.C. Chabert , C. Collard , G. Coulon, S. Falke , U. Goerlach , R. Haeberle , A.-C. Le Bihan , M. Meena , O. Poncet , G. Saha , M.A. Sessini , P. Vaucelle 

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

A. Di Florio 

Institut de Physique des 2 Infinis de Lyon (IP2I), Villeurbanne, France

D. Amram, S. Beauceron , B. Blancon , G. Boudoul , N. Chanon , D. Contardo , P. Depasse , C. Dozen²¹ , H. El Mamouni, J. Fay , S. Gascon , M. Gouzevitch , C. Greenberg , G. Grenier , B. Ille , E. Jourdhuy, I.B. Laktineh, M. Lethuillier , B. Massoteau, L. Mirabito, A. Purohit , M. Vander Donckt , J. Xiao 

Georgian Technical University, Tbilisi, Georgia

A. Khvedelidze²² , I. Lomidze , Z. Tsamalaidze²² 

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

V. Botta , S. Consuegra Rodríguez , L. Feld , K. Klein , M. Lipinski , D. Meuser , P. Nattland, V. Oppenländer, A. Pauls , D. Pérez Adán , N. Röwert , M. Teroerde 

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

C. Daumann, S. Diekmann , A. Dodonova , N. Eich , D. Eliseev , F. Engelke , J. Erdmann , M. Erdmann , B. Fischer , T. Hebbeker , K. Hoepfner , F. Ivone , A. Jung , N. Kumar , M.y. Lee , F. Mausolf , M. Merschmeyer , A. Meyer , F. Nowotny, A. Pozdnyakov , W. Redjeb , H. Reithler , U. Sarkar , V. Sarkisovi , A. Schmidt , C. Seth, A. Sharma , J.L. Spah , V. Vaulin, S. Zaleski

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

M.R. Beckers , C. Dziwok , G. Flügge , N. Hoefflich , T. Kress , A. Nowack , O. Pooth , A. Stahl , A. Zotz 

Deutsches Elektronen-Synchrotron, Hamburg, Germany

H. Aarup Petersen , A. Abel, M. Aldaya Martin , J. Alimena , S. Amoroso, Y. An , I. Andreev , J. Bach , S. Baxter , M. Bayatmakou , H. Becerril Gonzalez , O. Behnke , A. Belvedere , F. Blekman²³ , K. Borras²⁴ , A. Campbell , S. Chatterjee , L.X. Coll Saravia , G. Eckerlin, D. Eckstein , E. Gallo²³ , A. Geiser , V. Guglielmi , M. Guthoff , A. Hinzmann , L. Jeppe , M. Kasemann , C. Kleinwort , R. Kogler , M. Komm , D. Krücker , W. Lange, D. Leyva Pernia , K.-Y. Lin , K. Lipka²⁵ , W. Lohmann²⁶ , J. Malvaso, R. Mankel , I.-A. Melzer-Pellmann , M. Mendizabal Morentin , A.B. Meyer , G. Milella , K. Moral Figueroa , A. Mussgiller , L.P. Nair , J. Niedziela , A. Nürnberg , J. Park , E. Ranken , A. Raspereza , D. Rastorguev , L. Rygaard, M. Scham^{27,24} , S. Schnake²⁴ , P. Schütze , C. Schwanenberger²³ , D. Selivanova , K. Sharko , M. Shchedrolosiev , D. Stafford , M. Torkian, F. Vazzoler , A. Ventura Barroso , R. Walsh , D. Wang , Q. Wang , K. Wichmann, L. Wiens²⁴ , C. Wissing , Y. Yang , S. Zakharov, A. Zimmermann Castro Santos 

University of Hamburg, Hamburg, Germany

A. Albrecht , A.R. Alves Andrade , M. Antonello , S. Bollweg, M. Bonanomi , K. El Morabit , Y. Fischer , M. Frahm, E. Garutti , A. Grohsjean , J. Haller , D. Hundhausen, H.R. Jabusch , G. Kasieczka , P. Keicher , R. Klanner , W. Korcar , T. Kramer , C.c. Kuo, V. Kutzner , F. Labe , J. Lange , A. Lobanov , L. Moureaux , M. Mrowietz, A. Nigamova , K. Nikolopoulos, Y. Nissan, A. Paasch , K.J. Pena Rodriguez , N. Prouvost, T. Quadfasel , B. Raciti , M. Rieger , D. Savoie , J. Schindler , P. Schleper , M. Schröder , J. Schwandt , M. Sommerhalder , H. Stadie , G. Steinbrück , A. Tews, R. Ward, B. Wiederspan, M. Wolf 

Karlsruher Institut fuer Technologie, Karlsruhe, Germany

S. Brommer , E. Butz , Y.M. Chen , T. Chwalek , A. Dierlamm , G.G. Dincer , U. Elicabuk, N. Faltermann , M. Giffels , A. Gottmann , F. Hartmann²⁸ , R. Hofsaess , M. Horzela , U. Husemann , J. Kieseler , M. Klute , R. Kunnilan Muhammed Rafeek, O. Lavoryk , J.M. Lawhorn , A. Lintuluoto , S. Maier , M. Mormile , Th. Müller , M. Oh , E. Pfeffer , M. Presilla , G. Quast , K. Rabbertz , B. Regnery , R. Schmieder, N. Shadskiy , I. Shvetsov , H.J. Simonis , L. Sowa, L. Stockmeier, K. Tauqeer, M. Toms , B. Topko , N. Trevisani , C. Verstege , T. Voigtländer , R.F. Von Cube , J. Von Den Driesch, M. Wassmer , R. Wolf , W.D. Zerner, X. Zuo 

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

G. Anagnostou, G. Daskalakis , A. Kyriakis , A. Papadopoulos²⁸, A. Stakia 

National and Kapodistrian University of Athens, Athens, Greece

G. Melachroinos, Z. Painesis , I. Paraskevas , N. Saoulidou , K. Theofilatos , E. Tziaferi , K. Velididis , I. Zisopoulos 

National Technical University of Athens, Athens, Greece

T. Chatzistavrou, G. Karapostoli , K. Kousouris , E. Siamarkou, G. Tsipolitis 

University of Ioánnina, Ioánnina, Greece

I. Bestintzanos, I. Evangelou , C. Foudas, P. Katsoulis, P. Kokkas , P.G. Kosmoglou Kioseoglou , N. Manthos , I. Papadopoulos , J. Strologas 

HUN-REN Wigner Research Centre for Physics, Budapest, Hungary

D. Druzhkin , C. Hajdu , D. Horvath^{29,30} , K. Márton, A.J. Rádl³¹ , F. Sikler , V. Veszpremi 

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

M. Csanád , K. Farkas , A. Fehérkuti³² , M.M.A. Gadallah³³ , Á. Kadlecik , G. Pásztor , G.I. Veres 

Faculty of Informatics, University of Debrecen, Debrecen, Hungary

L. Olah , B. Ujvari 

HUN-REN ATOMKI - Institute of Nuclear Research, Debrecen, Hungary

G. Bencze, S. Czellar, J. Molnar, Z. Szillasi

Karoly Robert Campus, MATE Institute of Technology, Gyongyos, Hungary

T. Csorgo³² , F. Nemes³² , T. Novak , I. Szanyi³⁴ 

Panjab University, Chandigarh, India

S. Bansal , S.B. Beri, V. Bhatnagar , G. Chaudhary , S. Chauhan , N. Dhingra³⁵ , A. Kaur , A. Kaur , H. Kaur , M. Kaur , S. Kumar , T. Sheokand, J.B. Singh , A. Singla 

University of Delhi, Delhi, India

A. Bhardwaj , A. Chhetri , B.C. Choudhary , A. Kumar , A. Kumar , M. Naimuddin , S. Phor , K. Ranjan , M.K. Saini

University of Hyderabad, Hyderabad, India

S. Acharya³⁶ , B. Gomber³⁶ , B. Sahu³⁶ 

Indian Institute of Technology Kanpur, Kanpur, India

S. Mukherjee 

Saha Institute of Nuclear Physics, HBNI, Kolkata, India

S. Baradia , S. Bhattacharya , S. Das Gupta, S. Dutta , S. Dutta, S. Sarkar

Indian Institute of Technology Madras, Madras, India

M.M. Ameen , P.K. Behera , S. Chatterjee , G. Dash , A. Dattamunsi, P. Jana , P. Kalbhor , S. Kamble , J.R. Komaragiri³⁷ , T. Mishra , P.R. Pujahari , N.R. Saha , A.K. Sikdar , R.K. Singh , P. Verma , S. Verma , A. Vijay 

IISER Mohali, India, Mohali, India

B.K. Sirasva

Tata Institute of Fundamental Research-A, Mumbai, India

L. Bhatt, S. Dugad, G.B. Mohanty , M. Shelake, P. Suryadevara

Tata Institute of Fundamental Research-B, Mumbai, India

A. Bala , S. Banerjee , S. Barman³⁸ , R.M. Chatterjee, M. Guchait , Sh. Jain , A. Jaiswal, B.M. Joshi , S. Kumar , M. Maity³⁸, G. Majumder , K. Mazumdar , S. Parolia , R. Saxena , A. Thachayath 

National Institute of Science Education and Research, An OCC of Homi Bhabha National Institute, Bhubaneswar, Odisha, India

S. Bahinipati³⁹ , D. Maity⁴⁰ , P. Mal , K. Naskar⁴⁰ , A. Nayak⁴⁰ , S. Nayak, K. Pal , R. Raturi, P. Sadangi, S.K. Swain , S. Varghese⁴⁰ , D. Vats⁴⁰ 

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

A. Alpana , S. Dube , P. Hazarika , B. Kansal , A. Laha , R. Sharma , S. Sharma , K.Y. Vaish 

Indian Institute of Technology Hyderabad, Telangana, India

S. Ghosh 

Isfahan University of Technology, Isfahan, Iran

H. Bakhshiansohi⁴¹ , A. Jafari⁴² , V. Sedighzadeh Dalavi , M. Zeinali⁴³ 

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

S. Bashiri, S. Chenarani⁴⁴ , S.M. Etesami , Y. Hosseini , M. Khakzad , E. Khazaie , M. Moham-

madi Najafabadi^a, S. Tizchang⁴⁵

University College Dublin, Dublin, Ireland

M. Felcini, M. Grunewald

INFN Sezione di Bari^a, Università di Bari^b, Politecnico di Bari^c, Bari, Italy

M. Abbrescia^{a,b}, M. Barbieri^{a,b}, M. Buonsante^{a,b}, A. Colaleo^{a,b}, D. Creanza^{a,c}, B. D'Anzi^{a,b}, N. De Filippis^{a,c}, M. De Palma^{a,b}, W. Elmetenawee^{a,b,46}, N. Ferrara^{a,c}, L. Fiore^a, L. Longo^a, M. Louka^{a,b}, G. Maggi^{a,c}, M. Maggi^a, I. Margjeka^a, V. Mastrapasqua^{a,b}, S. My^{a,b}, F. Nenna^{a,b}, S. Nuzzo^{a,b}, A. Pellecchia^{a,b}, A. Pompili^{a,b}, G. Pugliese^{a,c}, R. Radogna^{a,b}, D. Ramos^a, A. Ranieri^a, L. Silvestris^a, F.M. Simone^{a,c}, Ü. Sözbilir^a, A. Stamerra^{a,b}, D. Troiano^{a,b}, R. Venditti^{a,b}, P. Verwilligen^a, A. Zaza^{a,b}

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

C. Battilana^{a,b}, D. Bonacorsi^{a,b}, P. Capiluppi^{a,b}, F.R. Cavallo^a, M. Cuffiani^{a,b}, G.M. Dallavalle^a, T. Diotallevi^{a,b}, F. Fabbri^a, A. Fanfani^{a,b}, D. Fasanella^a, P. Giacomelli^a, C. Grandi^a, L. Guiducci^{a,b}, S. Lo Meo^{a,47}, M. Lorusso^{a,b}, L. Lunerti^a, S. Marcellini^a, G. Masetti^a, F.L. Navarria^{a,b}, G. Paggi^{a,b}, A. Perrotta^a, F. Primavera^{a,b}, A.M. Rossi^{a,b}, S. Rossi Tisbeni^{a,b}, T. Rovelli^{a,b}, G.P. Siroli^{a,b}

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

S. Costa^{a,b,48}, A. Di Mattia^a, A. Lapertosa^a, R. Potenza^{a,b}, A. Tricomi^{a,b,48}

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

J. Altork^{a,b}, P. Assiouras^a, G. Barbagli^a, G. Bardelli^a, M. Bartolini^{a,b}, A. Calandri^{a,b}, B. Camaiani^{a,b}, A. Cassese^a, R. Ceccarelli^a, V. Ciulli^{a,b}, C. Civinini^a, R. D'Alessandro^{a,b}, L. Damenti^{a,b}, E. Focardi^{a,b}, T. Kello^a, G. Latino^{a,b}, P. Lenzi^{a,b}, M. Lizzo^a, M. Meschini^a, S. Paoletti^a, A. Papanastassiou^{a,b}, G. Sguazzoni^a, L. Viliani^a

INFN Laboratori Nazionali di Frascati, Frascati, Italy

L. Benussi, S. Bianco, S. Meola⁴⁹, D. Piccolo

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

M. Alves Gallo Pereira^a, F. Ferro^a, E. Robutti^a, S. Tosi^{a,b}

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

A. Benaglia^a, F. Brivio^a, V. Camagni^{a,b}, F. Cetorelli^{a,b}, F. De Guio^{a,b}, M.E. Dinardo^{a,b}, P. Dini^a, S. Gennai^a, R. Gerosa^{a,b}, A. Ghezzi^{a,b}, P. Govoni^{a,b}, L. Guzzi^a, G. Lavizzari^{a,b}, M.T. Lucchini^{a,b}, M. Malberti^a, S. Malvezzi^a, A. Massironi^a, D. Menasce^a, L. Moroni^a, M. Paganoni^{a,b}, S. Palluotto^{a,b}, D. Pedrini^a, A. Perego^{a,b}, B.S. Pinolini^a, G. Pizzati^{a,b}, S. Ragazzi^{a,b}, T. Tabarelli de Fatis^{a,b}

INFN Sezione di Napoli^a, Università di Napoli 'Federico II'^b, Napoli, Italy; Università della Basilicata^c, Potenza, Italy; Scuola Superiore Meridionale (SSM)^d, Napoli, Italy

S. Buontempo^a, A. Cagnotta^{a,b}, C. Di Fraia^{a,b}, F. Fabozzi^{a,c}, L. Favilla^{a,d}, A.O.M. Iorio^{a,b}, L. Lista^{a,b,50}, P. Paolucci^{a,28}, B. Rossi^a

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

P. Azzi^a, N. Bacchetta^{a,51}, M. Bellato^a, D. Bisello^{a,b}, P. Bortignon^a, G. Bortolato^{a,b}, A.C.M. Bulla^a, R. Carlin^{a,b}, P. Checchia^a, T. Dorigo^{a,52}, F. Gasparini^{a,b}, U. Gasparini^{a,b}, S. Giorgetti^a, E. Lusiani^a, M. Margoni^{a,b}, A.T. Meneguzzo^{a,b}, J. Pazzini^{a,b}, P. Ronchese^{a,b}, R. Rossin^{a,b}, F. Simonetto^{a,b}, M. Tosi^{a,b}, A. Triossi^{a,b}, S. Ventura^a, P. Zotto^{a,b}, A. Zucchetta^{a,b}

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

A. Braghieri^a, S. Calzaferri^a, P. Montagna^{a,b}, M. Pelliccioni^a, V. Re^a, C. Riccardi^{a,b}, P. Salvini^a, I. Vai^{a,b}, P. Vitulo^{a,b}

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

S. Ajmal^{a,b}, M.E. Ascioti^{a,b}, G.M. Bilei^a, C. Carrivale^{a,b}, D. Ciangottini^{a,b}, L. Della Penna^{a,b},

L. Fanò^{a,b}, V. Mariani^{a,b}, M. Menichelli^a, F. Moscatelli^{a,53}, A. Rossi^{a,b}, A. Santocchia^{a,b}, D. Spiga^a, T. Tedeschi^{a,b}

INFN Sezione di Pisa^a, Università di Pisa^b, Scuola Normale Superiore di Pisa^c, Pisa, Italy; Università di Siena^d, Siena, Italy

C. Aimè^{a,b}, C.A. Alexe^{a,c}, P. Asenov^{a,b}, P. Azzurri^a, G. Bagliesi^a, R. Bhattacharya^a, L. Bianchini^{a,b}, T. Boccali^a, E. Bossini^a, D. Bruschini^{a,c}, L. Calligaris^{a,b}, R. Castaldi^a, F. Cattafesta^{a,c}, M.A. Ciocci^{a,b}, M. Cipriani^{a,b}, V. D'Amante^{a,d}, R. Dell'Orso^a, S. Donato^{a,b}, R. Forti^{a,b}, A. Giassi^a, F. Ligabue^{a,c}, A.C. Marini^{a,b}, D. Matos Figueiredo^a, A. Messineo^{a,b}, S. Mishra^a, V.K. Muraleedharan Nair Bindhu^{a,b}, S. Nandan^a, F. Palla^a, M. Riggirello^{a,c}, A. Rizzi^{a,b}, G. Rolandi^{a,c}, S. Roy Chowdhury^{a,54}, T. Sarkar^a, A. Scribano^a, P. Spagnolo^a, F. Tenchini^{a,b}, R. Tenchini^a, G. Tonelli^{a,b}, N. Turini^{a,d}, F. Vaselli^{a,c}, A. Venturi^a, P.G. Verdini^a

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

P. Akrap^{a,b}, C. Basile^{a,b}, S.C. Behera^a, F. Cavallari^a, L. Cunqueiro Mendez^{a,b}, F. De Ruggi^{a,b}, D. Del Re^{a,b}, E. Di Marco^a, M. Diemoz^a, F. Errico^a, L. Frosina^{a,b}, R. Gargiulo^{a,b}, B. Harikrishnan^{a,b}, F. Lombardi^{a,b}, E. Longo^{a,b}, L. Martikainen^{a,b}, J. Mijuskovic^{a,b}, G. Organtini^{a,b}, N. Palmeri^{a,b}, R. Paramatti^{a,b}, C. Quaranta^{a,b}, S. Rahatlou^{a,b}, C. Rovelli^a, F. Santanastasio^{a,b}, L. Soffi^a, V. Vladimirov^{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,c}, R. Bellan^{a,b}, A. Bellora^{a,b}, C. Biino^a, C. Borca^{a,b}, N. Cartiglia^a, M. Costa^{a,b}, R. Covarelli^{a,b}, N. Demaria^a, M. Ferrero^a, L. Finco^a, M. Grippa^{a,b}, B. Kiani^{a,b}, L. Lanteri^{a,b}, F. Legger^a, F. Luongo^{a,b}, C. Mariotti^a, S. Maselli^a, A. Mecca^{a,b}, L. Menzio^{a,b}, P. Meridiani^a, E. Migliore^{a,b}, M. Monteno^a, M.M. Obertino^{a,b}, G. Ortona^a, L. Pacher^{a,b}, N. Pastrone^a, M. Ruspai^{a,c}, F. Siviero^{a,b}, V. Sola^{a,b}, A. Solano^{a,b}, C. Tarricone^{a,b}, D. Trocino^a, G. Umoret^{a,b}, E. Vlasov^{a,b}, R. White^{a,b}

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

J. Babbar^{a,b}, S. Belforte^a, V. Candelise^{a,b}, M. Casarsa^a, F. Cossutti^a, K. De Leo^a, G. Della Ricca^{a,b}, R. Delli Gatti^{a,b}

Kyungpook National University, Daegu, Korea

S. Dogra^{ID}, J. Hong^{ID}, J. Kim^{ID}, T. Kim^{ID}, D. Lee^{ID}, H. Lee^{ID}, J. Lee^{ID}, S.W. Lee^{ID}, C.S. Moon^{ID}, Y.D. Oh^{ID}, S. Sekmen^{ID}, B. Tae^{ID}, Y.C. Yang^{ID}

Department of Mathematics and Physics - GWNu, Gangneung, Korea

M.S. Kim^{ID}

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

G. Bak^{ID}, P. Gwak^{ID}, H. Kim^{ID}, D.H. Moon^{ID}, J. Seo^{ID}

Hanyang University, Seoul, Korea

E. Asilar^{ID}, F. Carnevali^{ID}, J. Choi⁵⁵^{ID}, T.J. Kim^{ID}, Y. Ryoo^{ID}

Korea University, Seoul, Korea

S. Ha^{ID}, S. Han^{ID}, B. Hong^{ID}, K. Lee^{ID}, K.S. Lee^{ID}, S. Lee^{ID}, J. Yoo^{ID}

Kyung Hee University, Department of Physics, Seoul, Korea

J. Goh^{ID}, J. Shin^{ID}, S. Yang^{ID}

Sejong University, Seoul, Korea

Y. Kang^{ID}, H. S. Kim^{ID}, Y. Kim^{ID}, S. Lee^{ID}

Seoul National University, Seoul, Korea

J. Almond^{ID}, J.H. Bhyun^{ID}, J. Choi^{ID}, J. Choi^{ID}, W. Jun^{ID}, J. Kim^{ID}, T. Kim^{ID}, Y. Kim^{ID}, Y.W. Kim^{ID}, S. Ko^{ID}, H. Lee^{ID}, J. Lee^{ID}, J. Lee^{ID}, B.H. Oh^{ID}, S.B. Oh^{ID}, H. Seo^{ID}, J. Shin^{ID}, U.K. Yang^{ID}, I. Yoon^{ID}

University of Seoul, Seoul, Korea

W. Jang , D.Y. Kang, D. Kim , S. Kim , B. Ko, J.S.H. Lee , Y. Lee , J.A. Merlin, I.C. Park , Y. Roh, I.J. Watson 

Yonsei University, Department of Physics, Seoul, Korea

G. Cho, K. Hwang , B. Kim , S. Kim, K. Lee , H.D. Yoo 

Sungkyunkwan University, Suwon, Korea

M. Choi , M.R. Kim , Y. Lee , I. Yu 

College of Engineering and Technology, American University of the Middle East (AUM), Dasman, Kuwait

T. Beyrouthy , Y. Gharbia 

Kuwait University - College of Science - Department of Physics, Safat, Kuwait

F. Alazemi 

Riga Technical University, Riga, Latvia

K. Dreimanis , O.M. Eberlins , A. Gaile , C. Munoz Diaz , D. Osite , G. Pikurs, R. Plese , A. Potrebko , M. Seidel , D. Sidiropoulos Kontos 

University of Latvia (LU), Riga, Latvia

N.R. Strautnieks 

Vilnius University, Vilnius, Lithuania

M. Ambrozias , A. Juodagalvis , S. Nargelas , A. Rinkevicius , G. Tamulaitis 

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

I. Yusuff⁵⁶ , Z. Zolkapli

Universidad de Sonora (UNISON), Hermosillo, Mexico

J.F. Benitez , A. Castaneda Hernandez , A. Cota Rodriguez , L.E. Cuevas Picos, H.A. Encinas Acosta, L.G. Gallegos Maríñez, M. León Cello , J.A. Murillo Quijada , A. Sehrawat , L. Valencia Palomo 

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

G. Ayala , H. Castilla-Valdez , H. Crotte Ledesma, R. Lopez-Fernandez , J. Mejia Guisao , R. Reyes-Almanza , A. Sánchez Hernández 

Universidad Iberoamericana, Mexico City, Mexico

C. Oropeza Barrera , D.L. Ramirez Guadarrama, M. Ramírez García 

Benemerita Universidad Autonoma de Puebla, Puebla, Mexico

I. Bautista , F.E. Neri Huerta , I. Pedraza , H.A. Salazar Ibarguen , C. Uribe Estrada 

University of Montenegro, Podgorica, Montenegro

I. Bubanja , N. Raicevic 

University of Canterbury, Christchurch, New Zealand

P.H. Butler 

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

A. Ahmad , M.I. Asghar, A. Awais , M.I.M. Awan, W.A. Khan 

AGH University of Krakow, Krakow, Poland

V. Avati, L. Forthomme , L. Grzanka , M. Malawski , K. Piotrkowski

National Centre for Nuclear Research, Swierk, Poland

M. Bluj , M. Górski , M. Kazana , M. Szleper , P. Zalewski 

Institute of Experimental Physics, Faculty of Physics, University of Warsaw, Warsaw, Poland

K. Bunkowski , K. Doroba , A. Kalinowski , M. Konecki , J. Krolikowski , A. Muhammad 

Warsaw University of Technology, Warsaw, Poland

P. Fokow , K. Pozniak , W. Zabolotny 

Laboratório de Instrumentação e Física Experimental de Partículas, Lisboa, Portugal

M. Araujo , D. Bastos , C. Beirão Da Cruz E Silva , A. Boletti , M. Bozzo , T. Camporesi , G. Da Molin , P. Faccioli , M. Gallinaro , J. Hollar , N. Leonardo , G.B. Marozzo , A. Petrilli , M. Pisano , J. Seixas , J. Varela , J.W. Wulff 

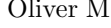
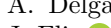
Faculty of Physics, University of Belgrade, Belgrade, Serbia

P. Adzic , L. Markovic , P. Milenovic , V. Milosevic 

VINCA Institute of Nuclear Sciences, University of Belgrade, Belgrade, Serbia

D. Devetak , M. Dordevic , J. Milosevic , L. Nadderd , V. Rekovic , M. Stojanovic 

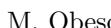
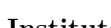
Centro de Investigaciones Energéticas Medioambientales y Tecnológicas (CIEMAT), Madrid, Spain

M. Alcaraz Martinez , J. Alcaraz Maestre , Cristina F. Bedoya , J.A. Brochero Cifuentes , Oliver M. Carretero , M. Cepeda , M. Cerrada , N. Colino , J. Cuchillo Ortega , B. De La Cruz , A. Delgado Peris , A. Escalante Del Valle , D. Fernández Del Val , J.P. Fernández Ramos , J. Flix , M.C. Fouz , M. Gonzalez Hernandez , O. Gonzalez Lopez , S. Goy Lopez , J.M. Hernandez , M.I. Josa , J. Llorente Merino , C. Martin Perez , E. Martin Viscasillas , D. Moran , C. M. Morcillo Perez , R. Paz Herrera , C. Perez Dengra , A. Pérez-Calero Yzquierdo , J. Puerta Pelayo , I. Redondo , J. Vazquez Escobar 

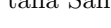
Universidad Autónoma de Madrid, Madrid, Spain

J.F. de Trocóniz 

Universidad de Oviedo, Instituto Universitario de Ciencias y Tecnologías Espaciales de Asturias (ICTEA), Oviedo, Spain

B. Alvarez Gonzalez , J. Ayllon Torresano , A. Cardini , J. Cuevas , J. Del Riego Badas , D. Estrada Acevedo , J. Fernandez Menendez , S. Folgueras , I. Gonzalez Caballero , P. Leguina , M. Obeso Menendez , E. Palencia Cortezon , J. Prado Pico , A. Soto Rodríguez , A. Trapote , C. Vico Villalba , P. Vischia 

Instituto de Física de Cantabria (IFCA), CSIC-Universidad de Cantabria, Santander, Spain

S. Blanco Fernández , I.J. Cabrillo , A. Calderon , J. Duarte Campderros , M. Fernandez , G. Gomez , C. Lasasosa García , R. Lopez Ruiz , C. Martinez Rivero , P. Martinez Ruiz del Arbol , F. Matorras , P. Matorras Cuevas , E. Navarrete Ramos , J. Piedra Gomez , C. Quintana San Emeterio , L. Scodellaro , I. Vila , R. Vilar Cortabitarte , J.M. Vizan Garcia 

University of Colombo, Colombo, Sri Lanka

B. Kailasapathy⁵⁷ , D.D.C. Wickramaratna 

University of Ruhuna, Department of Physics, Matara, Sri Lanka

W.G.D. Dharmaratna⁵⁸ , K. Liyanage , N. Perera 

CERN, European Organization for Nuclear Research, Geneva, Switzerland

D. Abbaneo , C. Amendola , R. Ardino , E. Auffray , J. Baechler , D. Barney , M. Bianco , A. Bocci , L. Borgonovi , C. Botta , A. Bragagnolo , C.E. Brown , C. Caillol , G. Cerminara , P. Connor , D. d'Enterria , A. Dabrowski , A. David , A. De Roeck , M.M. Defranchis , M. Deile , M. Dobson , W. Funk , A. Gaddi , S. Giani , D. Gigi , K. Gill , F. Glege , M. Glowacki , A. Gruber , J. Hegeman , J.K. Heikkilä , B. Huber , V. Innocente , T. James , P. Janot , O. Kaluzinska , O. Karacheban²⁶ , G. Karathanasis , S. Laurila , P. Lecoq , C. Lourenço , A.-M. Lyon , M. Magherini , L. Malgeri , M. Mannelli , M. Matthewman , A. Mehta , F. Meijers , S. Mersi , E. Meschi , M. Migliorini , F. Monti , F. Moortgat , M. Mulders , M. Musich , I. Neutelings , S. Orfanelli , F. Pantaleo , M. Pari , G. Petrucciani , A. Pfeiffer , M. Pierini , M. Pitt , H. Qu , D. Rabady , B. Ribeiro Lopes , F. Riti , P. Rosado , M. Rovere , H. Sakulin , R. Salvatico , S. Sanchez Cruz , S. Scarfi , C. Schwick , M. Selvaggi , A. Sharma , K. Shchelina , P. Silva , P. Sphicas⁵⁹ , A.G. Stahl Leiton , A. Steen , S. Summers , D. Treille , P. Tropea , E. Vernazza , J. Wanczyk⁶⁰ , J. Wang , S. Wuchterl , M. Zarucki , P. Zehetner , P. Jezdl , G. Zevi Della Porta 

PSI Center for Neutron and Muon Sciences, Villigen, Switzerland

T. Bevilacqua⁶¹ , L. Caminada⁶¹ , W. Erdmann , R. Horisberger , Q. Ingram , H.C. Kaestli , D. Kotlinski , C. Lange , U. Langenegger , M. Missiroli⁶¹ , L. Noehte⁶¹ , T. Rohe , A. Samalan

ETH Zurich - Institute for Particle Physics and Astrophysics (IPA), Zurich, Switzerland

T.K. Aarrestad , M. Backhaus , G. Bonomelli , C. Cazzaniga , K. Datta , P. De Bryas Dexmiers D'archiacchiac⁶⁰ , A. De Cosa , G. Dissertori , M. Dittmar, M. Donegà , F. Eble , K. Gedia , F. Gless-gen , C. Grab , N. Häringer , T.G. Harte, W. Lustermann , M. Malucchi , R.A. Manzoni , M. Marchegiani , L. Marchese , A. Mascellani⁶⁰ , F. Nessi-Tedaldi , F. Pauss , V. Perovic , B. Ristic , R. Seidita , A. Tarabini , D. Valsecchi , R. Wallny 

Universität Zürich, Zurich, Switzerland

C. Amsler⁶² , P. Bäertschi , F. Bilandzija, M.F. Canelli , G. Celotto, K. Cormier , M. Huwiler , W. Jin , A. Jofrehei , B. Kilminster , T.H. Kwok, S. Leontsinis , V. Lukashenko, A. Macchiolo , F. Meng , J. Motta , A. Reimers , P. Robmann, M. Senger , E. Shokr, F. Stäger , R. Tramon-tano 

National Central University, Chung-Li, Taiwan

D. Bhowmik, C.M. Kuo, P.K. Rout , S. Taj, P.C. Tiwari³⁷ 

National Taiwan University (NTU), Taipei, Taiwan

L. Ceard, K.F. Chen , Z.g. Chen, A. De Iorio , W.-S. Hou , T.h. Hsu, Y.w. Kao, S. Karmakar , G. Kole , Y.y. Li , R.-S. Lu , E. Paganis , X.f. Su , J. Thomas-Wilsker , L.s. Tsai, D. Tsionou, H.y. Wu, E. Yazgan 

High Energy Physics Research Unit, Department of Physics, Faculty of Science, Chula-longkorn University, Bangkok, Thailand

C. Asawatangtrakuldee , N. Srimanobhas 

Tunis El Manar University, Tunis, Tunisia

Y. Maghrbi 

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

D. Agyel , F. Boran , F. Dolek , I. Dumanoglu⁶³ , Y. Guler⁶⁴ , E. Gurpinar Guler⁶⁴ , C. Isik , O. Kara, A. Kayis Topaksu , Y. Komurcu , G. Onengut , K. Ozdemir⁶⁵ , B. Tali⁶⁶ , U.G. Tok , E. Uslan , I.S. Zorbakir 

Middle East Technical University, Physics Department, Ankara, Turkey

M. Yalvac⁶⁷ 

Bogazici University, Istanbul, Turkey

B. Akgun , I.O. Atakisi⁶⁸ , E. Gülmez , M. Kaya⁶⁹ , O. Kaya⁷⁰ , M.A. Sarkisla⁷¹, S. Tekten⁷² 

Istanbul Technical University, Istanbul, Turkey

A. Cakir , K. Cankocak^{63,73} , S. Sen⁷⁴ 

Istanbul University, Istanbul, Turkey

O. Aydilek⁷⁵ , B. Hacisahinoglu , I. Hos⁷⁶ , B. Kaynak , S. Ozkorucuklu , O. Potok , H. Sert , C. Simsek , C. Zorbilmez 

Yildiz Technical University, Istanbul, Turkey

S. Cerci , A.A. Guvenli, B. Isildak⁷⁷ , D. Sunar Cerci , T. Yetkin²¹ 

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

A. Boyaryntsev , O. Dadazhanova, B. Grynyov 

National Science Centre, Kharkiv Institute of Physics and Technology, Kharkiv, Ukraine

L. Levchuk 

University of Bristol, Bristol, United Kingdom

J.J. Brooke , A. Bundock , F. Bury , E. Clement , D. Cussans , D. Dharmender, H. Flacher , J. Goldstein , H.F. Heath , M.-L. Holmberg , L. Kreczko , S. Paramesvaran , L. Robertshaw,

M.S. Sanjrani, J. Segal, V.J. Smith 

Rutherford Appleton Laboratory, Didcot, United Kingdom

A.H. Ball, K.W. Bell , A. Belyaev⁷⁸ , C. Brew , R.M. Brown , D.J.A. Cockerill , C. Cooke , A. Elliot , K.V. Ellis, J. Gajownik, K. Harder , S. Harper , J. Linacre , K. Manolopoulos, M. Moallemi , D.M. Newbold , E. Olaiya, D. Petyt , T. Reis , A.R. Sahasransu , G. Salvi , T. Schuh, C.H. Shepherd-Themistocleous , I.R. Tomalin , K.C. Whalen , T. Williams 

Imperial College, London, United Kingdom

I. Andreou , R. Bainbridge , P. Bloch , O. Buchmuller, C.A. Carrillo Montoya , D. Colling , J.S. Dancu, I. Das , P. Dauncey , G. Davies , M. Della Negra , S. Fayer, G. Fedi , G. Hall , H.R. Hoorani , A. Howard, G. Iles , C.R. Knight , P. Krueper, J. Langford , K.H. Law , J. León Holgado , E. Leutgeb , L. Lyons , A.-M. Magnan , B. Maier , S. Mallios, A. Mastronikolis, M. Mieskolainen , J. Nash⁷⁹ , M. Pesaresi , P.B. Pradeep, B.C. Radburn-Smith , A. Richards, A. Rose , L. Russell , K. Savva , C. Seez , R. Shukla , A. Tapper , K. Uchida , G.P. Uttley , T. Virdee²⁸ , M. Vojinovic , N. Wardle , D. Winterbottom 

Brunel University, Uxbridge, United Kingdom

J.E. Cole , A. Khan, P. Kyberd , I.D. Reid 

Baylor University, Waco, Texas, USA

S. Abdullin , A. Brinkerhoff , E. Collins , M.R. Darwish , J. Dittmann , K. Hatakeyama , V. Hegde , J. Hiltbrand , B. McMaster , J. Samudio , S. Sawant , C. Sutantawibul , J. Wilson 

Bethel University, St. Paul, Minnesota, USA

J.M. Hogan⁸⁰ 

Catholic University of America, Washington, DC, USA

R. Bartek , A. Dominguez , S. Raj , A.E. Simsek , S.S. Yu 

The University of Alabama, Tuscaloosa, Alabama, USA

B. Bam , A. Buchot Perraguin , S. Campbell, R. Chudasama , S.I. Cooper , C. Crovella , G. Fidalgo , S.V. Gleyzer , A. Khukhunaishvili , K. Matchev , E. Pearson, C.U. Perez , P. Rumerio⁸¹ , E. Usai , R. Yi 

Boston University, Boston, Massachusetts, USA

S. Cholak , G. De Castro, Z. Demiragli , C. Erice , C. Fangmeier , C. Fernandez Madrazo , E. Fontanesi , J. Fulcher , F. Golf , S. Jeon , J. O'Cain, I. Reed , J. Rohlf , K. Salyer , D. Sperka , D. Spitzbart , I. Suarez , A. Tsatsos , E. Wurtz, A.G. Zecchinelli 

Brown University, Providence, Rhode Island, USA

G. Barone , G. Benelli , D. Cutts , S. Ellis, L. Gouskos , M. Hadley , U. Heintz , K.W. Ho , T. Kwon , G. Landsberg , K.T. Lau , J. Luo , S. Mondal , J. Roloff, T. Russell, S. Sagir⁸² , X. Shen , M. Stamenkovic , N. Venkatasubramanian

University of California, Davis, Davis, California, USA

S. Abbott , B. Barton , R. Breedon , H. Cai , M. Calderon De La Barca Sanchez , M. Chertok , M. Citron , J. Conway , P.T. Cox , R. Erbacher , O. Kukral , G. Mocellin , S. Ostrom , W. Wei , S. Yoo 

University of California, Los Angeles, California, USA

K. Adamidis, M. Bachtis , D. Campos, R. Cousins , A. Datta , G. Flores Avila , J. Hauser , M. Ignatenko , M.A. Iqbal , T. Lam , Y.f. Lo, E. Manca , A. Nunez Del Prado, D. Saltzberg , V. Valuev 

University of California, Riverside, Riverside, California, USA

R. Clare , J.W. Gary , G. Hanson 

University of California, San Diego, La Jolla, California, USA

A. Aportela, A. Arora , J.G. Branson , S. Cittolin , S. Cooperstein , D. Diaz , J. Duarte , L. Giannini , Y. Gu, J. Guiang , V. Krutelyov , R. Lee , J. Letts , H. Li, M. Masciovecchio 

F. Mokhtar , S. Mukherjee , M. Pieri , D. Primosch, M. Quinnan , V. Sharma , M. Tadel , E. Vourliotis , F. Würthwein , A. Yagil , Z. Zhao

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

A. Barzdukas , L. Brennan , C. Campagnari , S. Carron Montero⁸³, K. Downham , C. Grieco , M.M. Hussain, J. Incandela , J. Kim , M.W.K. Lai, A.J. Li , P. Masterson , J. Richman , S.N. Santpur , U. Sarica , R. Schmitz , F. Setti , J. Sheplock , D. Stuart , T.Á. Vámi , X. Yan , D. Zhang

California Institute of Technology, Pasadena, California, USA

A. Albert, S. Bhattacharya , A. Bornheim , O. Cerri, R. Kansal , J. Mao , H.B. Newman , G. Reales Gutiérrez, T. Sievert, M. Spiropulu , J.R. Vlimant , R.A. Wynne, S. Xie 

Carnegie Mellon University, Pittsburgh, Pennsylvania, USA

J. Alison , S. An , M. Cremonesi, V. Dutta , E.Y. Ertorer , T. Ferguson , T.A. Gómez Espinosa , A. Harilal , A. Kallil Tharayil, M. Kanemura, C. Liu , P. Meiring , T. Mudholkar , S. Murthy , P. Palit , K. Park, M. Paulini , A. Roberts , A. Sanchez , W. Terrill 

University of Colorado Boulder, Boulder, Colorado, USA

J.P. Cumalat , W.T. Ford , A. Hart , A. Hassani , S. Kwan , J. Pearkes , C. Savard , N. Schonbeck , K. Stenson , K.A. Ulmer , S.R. Wagner , N. Zipper , D. Zuolo 

Cornell University, Ithaca, New York, USA

J. Alexander , X. Chen , D.J. Cranshaw , J. Dickinson , J. Fan , X. Fan , J. Grassi , S. Hogan , P. Kotamnives, J. Monroy , G. Niendorf, M. Oshiro , J.R. Patterson , M. Reid , A. Ryd , J. Thom , P. Wittich , R. Zou , L. Zygala 

Fermi National Accelerator Laboratory, Batavia, Illinois, USA

M. Albrow , M. Alyari , O. Amram , G. Apollinari , A. Apresyan , L.A.T. Bauerdick , D. Berry , J. Berryhill , P.C. Bhat , K. Burkett , J.N. Butler , A. Canepa , G.B. Cerati , H.W.K. Cheung , F. Chlebana , C. Cosby , G. Cummings , I. Dutta , V.D. Elvira , J. Freeman , A. Gandrakota , Z. Gece , L. Gray , D. Green, A. Grummer , S. Grünendahl , D. Guerrero , O. Gutsche , R.M. Harris , T.C. Herwig , J. Hirschauer , B. Jayatilaka , S. Jindariani , M. Johnson , U. Joshi , T. Klijnsma , B. Klima , K.H.M. Kwok , S. Lammel , C. Lee , D. Lincoln , R. Lipton , T. Liu , K. Maeshima , D. Mason , P. McBride , P. Merkel , S. Mrenna , S. Nahn , J. Ngadiuba , D. Noonan , S. Norberg, V. Papadimitriou , N. Pastika , K. Pedro , C. Pena⁸⁴ , C.E. Perez Lara , F. Ravera , A. Reinsvold Hall⁸⁵ , L. Ristori , M. Safdari , E. Sexton-Kennedy , N. Smith , A. Soha , L. Spiegel , S. Stoynev , J. Strait , L. Taylor , S. Tkaczyk , N.V. Tran , L. Uplegger , E.W. Vaandering , C. Wang , I. Zoi 

University of Florida, Gainesville, Florida, USA

C. Aruta , P. Avery , D. Bourilkov , P. Chang , V. Cherepanov , R.D. Field, C. Huh , E. Koenig , M. Kolosova , J. Konigsberg , A. Korytov , N. Menendez , G. Mitselmakher , K. Mohrman , A. Muthirakalayil Madhu , N. Rawal , S. Rosenzweig , V. Sulimov , Y. Takahashi , J. Wang 

Florida State University, Tallahassee, Florida, USA

T. Adams , A. Al Kadhimi , A. Askew , S. Bower , R. Hashmi , R.S. Kim , T. Kolberg , G. Martinez, M. Mazza, H. Prosper , P.R. Prova, M. Wulansatiti , R. Yohay 

Florida Institute of Technology, Melbourne, Florida, USA

B. Alsufyani , S. Butalla , S. Das , M. Hohmann , M. Lavinsky, E. Yanes

University of Illinois Chicago, Chicago, Illinois, USA

M.R. Adams , N. Barnett, A. Baty , C. Bennett, R. Cavanaugh , R. Escobar Franco , O. Evdokimov , C.E. Gerber , H. Gupta, M. Hawksworth, A. Hingrajiya, D.J. Hofman , J.h. Lee , D. S. Lemos , C. Mills , S. Nanda , G. Nigmatkulov , B. Ozek , T. Phan, D. Pilipovic , R. Pradhan , E. Prifti, P. Roy, T. Roy , N. Singh, M.B. Tonjes , N. Varelas , M.A. Wadud , J. Yoo 

The University of Iowa, Iowa City, Iowa, USA

M. Alhusseini , D. Blend , K. Dilsiz⁸⁶ , O.K. Köseyan , A. Mestvirishvili⁸⁷ , O. Neogi , H. Ogul⁸⁸ , Y. Onel , A. Penzo , C. Snyder , E. Tiras⁸⁹ 

Johns Hopkins University, Baltimore, Maryland, USA

B. Blumenfeld , J. Davis , A.V. Gritsan , L. Kang , S. Kyriacou , P. Maksimovic , M. Roguljic , S. Sekhar , M.V. Srivastav , M. Swartz 

The University of Kansas, Lawrence, Kansas, USA

A. Abreu , L.F. Alcerro Alcerro , J. Anguiano , S. Arteaga Escatel , P. Baringer , A. Bean , Z. Flowers , D. Grove , J. King , G. Krintiras , M. Lazarovits , C. Le Mahieu , J. Marquez , M. Murray , M. Nickel , S. Popescu⁹⁰ , C. Rogan , C. Royon , S. Rudrabhatla , S. Sanders , C. Smith , G. Wilson 

Kansas State University, Manhattan, Kansas, USA

B. Allmond , R. Gujju Gurunadha , N. Islam , A. Ivanov , K. Kaadze , Y. Maravin , J. Natoli , D. Roy , G. Sorrentino 

University of Maryland, College Park, Maryland, USA

A. Baden , A. Belloni , J. Bistany-riebman , S.C. Eno , N.J. Hadley , S. Jabeen , R.G. Kellogg , T. Koeth , B. Kronheim , S. Lascio , P. Major , A.C. Mignerey , C. Palmer , C. Papageorgakis , M.M. Paranjpe , E. Popova⁹¹ , A. Shevelev , L. Zhang 

Massachusetts Institute of Technology, Cambridge, Massachusetts, USA

C. Baldenegro Barrera , J. Bendavid , H. Bossi , S. Bright-Thonney , I.A. Cali , Y.c. Chen , P.c. Chou , M. D'Alfonso , J. Eysermans , C. Freer , G. Gomez-Ceballos , M. Goncharov , G. Grosso , P. Harris , D. Hoang , G.M. Innocenti , D. Kovalskiy , J. Krupa , L. Lavezzo , Y.-J. Lee , K. Long , C. McGinn , A. Novak , M.I. Park , C. Paus , C. Reissel , C. Roland , G. Roland , S. Rothman , T.a. Sheng , G.S.F. Stephans , D. Walter , Z. Wang , B. Wyslouch , T. J. Yang 

University of Minnesota, Minneapolis, Minnesota, USA

B. Crossman , W.J. Jackson , C. Kapsiak , M. Krohn , D. Mahon , J. Mans , B. Marzocchi , M. Revering , R. Rusack , O. Sancar , R. Saradhy , N. Strobbe 

University of Nebraska-Lincoln, Lincoln, Nebraska, USA

K. Bloom , D.R. Claes , G. Haza , J. Hossain , C. Joo , I. Kravchenko , A. Rohilla , J.E. Siado , W. Tabb , A. Vagnerini , A. Wightman , F. Yan 

State University of New York at Buffalo, Buffalo, New York, USA

H. Bandyopadhyay , L. Hay , H.w. Hsia , I. Iashvili , A. Kalogeropoulos , A. Kharchilava , A. Mandal , M. Morris , D. Nguyen , S. Rappoccio , H. Rejeb Sfar , A. Williams , P. Young , D. Yu 

Northeastern University, Boston, Massachusetts, USA

G. Alverson , E. Barberis , J. Bonilla , B. Bylsma , M. Campana , J. Dervan , Y. Haddad , Y. Han , I. Israr , A. Krishna , J. Li , M. Lu , N. Manganelli , R. McCarthy , D.M. Morse , T. Orimoto , A. Parker , L. Skinnari , C.S. Thoreson , E. Tsai , D. Wood 

Northwestern University, Evanston, Illinois, USA

S. Dittmer , K.A. Hahn , Y. Liu , M. McGinnis , Y. Miao , D.G. Monk , M.H. Schmitt , A. Taliencio , M. Velasco , J. Wang 

University of Notre Dame, Notre Dame, Indiana, USA

G. Agarwal , R. Band , R. Bucci , S. Castells , A. Das , A. Ehnis , R. Goldouzian , M. Hildreth , K. Hurtado Anampa , T. Ivanov , C. Jessop , A. Karneyeu , K. Lannon , J. Lawrence , N. Loukas , L. Lutton , J. Mariano , N. Marinelli , I. Mcalister , T. McCauley , C. McGrady , C. Moore , Y. Musienko²² , H. Nelson , M. Osherson , A. Piccinelli , R. Ruchti , A. Townsend , Y. Wan , M. Wayne , H. Yockey 

The Ohio State University, Columbus, Ohio, USA

A. Basnet , M. Carrigan , R. De Los Santos , L.S. Durkin , C. Hill , M. Joyce , M. Nunez Or-

nelas , D.A. Wenzl, B.L. Winer , B. R. Yates 

Princeton University, Princeton, New Jersey, USA

H. Bouchamaoui , K. Coldham, P. Das , G. Dezoort , P. Elmer , A. Frankenthal , M. Galli , B. Greenberg , N. Haubrich , K. Kennedy, G. Kopp , Y. Lai , D. Lange , A. Loeliger , D. Marlow , I. Ojalvo , J. Olsen , F. Simpson , D. Stickland , C. Tully 

University of Puerto Rico, Mayaguez, Puerto Rico, USA

S. Malik , R. Sharma

Purdue University, West Lafayette, Indiana, USA

A.S. Bakshi , S. Chandra , R. Chawla , A. Gu , L. Gutay, M. Jones , A.W. Jung , D. Konratyev , M. Liu , G. Negro , N. Neumeister , G. Paspalaki , S. Piperov , J.F. Schulte , F. Wang , A. Wildridge , W. Xie , Y. Yao , Y. Zhong 

Purdue University Northwest, Hammond, Indiana, USA

J. Dolen , N. Parashar , A. Pathak , E. Shumka 

Rice University, Houston, Texas, USA

D. Acosta , A. Agrawal , C. Arbour, T. Carnahan , K.M. Ecklund , P.J. Fernández Manteca , S. Freed, P. Gardner, F.J.M. Geurts , T. Huang , I. Krommydas , N. Lewis, W. Li , J. Lin , O. Miguel Colin , B.P. Padley , R. Redjimi, J. Rotter , E. Yigitbasi , Y. Zhang 

University of Rochester, Rochester, New York, USA

O. Bessidskaia Bylund, A. Bodek , P. de Barbaro[†] , R. Demina , J.L. Dulemba , A. Garcia-Bellido , H.S. Hare, O. Hindrichs , N. Parmar , P. Parygin⁹¹ , R. Taus 

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

B. Chiarito, J.P. Chou , S.V. Clark , S. Donnelly, D. Gadkari , Y. Gershtein , E. Halkiadakis , M. Heindl , C. Houghton , D. Jaroslawski , S. Konstantinou , I. Laflotte , A. Lath , J. Martins , B. Rand, J. Reichert , P. Saha , S. Salur , S. Schnetzer, S. Somalwar , R. Stone , S.A. Thayil , S. Thomas, J. Vora 

University of Tennessee, Knoxville, Tennessee, USA

D. Ally , A.G. Delannoy , S. Fiorendi , J. Harris, S. Higginbotham , T. Holmes , A.R. Kanuganti , N. Karunarathna , J. Lawless, L. Lee , E. Nibigira , B. Skipworth, S. Spanier 

Texas A&M University, College Station, Texas, USA

D. Aebi , M. Ahmad , T. Akhter , K. Androsov , A. Bolshov, O. Bouhali⁹² , R. Eusebi , P. Flanagan , J. Gilmore , Y. Guo, T. Kamon , H. Kim , S. Luo , R. Mueller , A. Safonov 

Texas Tech University, Lubbock, Texas, USA

N. Akchurin , J. Damgov , Y. Feng , N. Gogate , Y. Kazhykarim, K. Lamichhane , S.W. Lee , C. Madrid , A. Mankel , T. Peltola , I. Volobouev 

Vanderbilt University, Nashville, Tennessee, USA

E. Appelt , Y. Chen , S. Greene, A. Gurrola , W. Johns , R. Kunnawalkam Elayavalli , A. Melo , D. Rathjens , F. Romeo , P. Sheldon , S. Tuo , J. Velkovska , J. Viinikainen , J. Zhang

University of Virginia, Charlottesville, Virginia, USA

B. Cardwell , H. Chung, B. Cox , J. Hakala , R. Hirosky , M. Jose, A. Ledovskoy , C. Mantilla , C. Neu , C. Ramón Álvarez 

Wayne State University, Detroit, Michigan, USA

S. Bhattacharya , P.E. Karchin 

University of Wisconsin - Madison, Madison, Wisconsin, USA

A. Aravind , S. Banerjee , K. Black , T. Bose , E. Chavez , S. Dasu , P. Everaerts , C. Galloni, H. He , M. Herndon , A. Herve , C.K. Koraka , S. Lomte, R. Loveless , A. Mallampalli , A. Mohammadi , S. Mondal, T. Nelson, G. Parida , L. Pétré , D. Pinna, A. Savin, V. Shang , V. Sharma , W.H. Smith , D. Teague, H.F. Tsoi , W. Vetens , A. Warden 

Authors affiliated with an international laboratory formerly covered by a cooperation agreement with CERN

L. Dudko¹, G. Gavrillov², V. Golovtsov³, K. Ivanov⁴, Y. Ivanov⁵, V. Kim⁹⁵, V. Murzin⁶, V. Oreshkin⁷, D. Sosnov⁸, V. Sulimov⁹, L. Uvarov¹⁰, A. Vorobyev[†]

Authors affiliated with an institute covered by a cooperation agreement with CERN

S. Afanasiev¹¹, V. Alexakhin¹², Yu. Andreev¹³, T. Aushev¹⁴, D. Budkouski¹⁵, R. Chistov⁹³, M. Danilov⁹³, T. Dimova⁹³, A. Ershov⁹³, S. Gninenko¹⁶, I. Gorbunov¹⁷, A. Gribushin⁹³, A. Kamenev¹⁸, V. Karjavine¹⁹, M. Kirsanov²⁰, V. Klyukhin⁹³, O. Kodolova^{94,91}, V. Korenkov²¹, A. Kozyrev⁹³, N. Krasnikov²², A. Lanev²³, A. Malakhov²⁴, V. Matveev⁹³, A. Nikitenko^{95,94}, V. Palichik²⁵, V. Perelygin²⁶, S. Petrushanko⁹³, S. Polikarpov⁹³, O. Radchenko⁹³, M. Savina²⁷, V. Shalaev²⁸, S. Shmatov²⁹, S. Shulha³⁰, Y. Skovpen⁹³, V. Smirnov³¹, O. Teryaev³², I. Tlisova⁹³, A. Toropin³³, N. Voytishin³⁴, B.S. Yuldashev^{†96}, A. Zarubin³⁵, I. Zhizhin³⁶

†: Deceased

¹Also at Yerevan State University, Yerevan, Armenia

²Also at TU Wien, Vienna, Austria

³Also at Ghent University, Ghent, Belgium

⁴Also at Universidade do Estado do Rio de Janeiro, Rio de Janeiro, Brazil

⁵Also at FACAMP - Faculdades de Campinas, Sao Paulo, Brazil

⁶Also at Universidade Estadual de Campinas, Campinas, Brazil

⁷Also at Federal University of Rio Grande do Sul, Porto Alegre, Brazil

⁸Also at The University of the State of Amazonas, Manaus, Brazil

⁹Also at University of Chinese Academy of Sciences, Beijing, China

¹⁰Also at China Center of Advanced Science and Technology, Beijing, China

¹¹Also at University of Chinese Academy of Sciences, Beijing, China

¹²Now at Henan Normal University, Xinxiang, China

¹³Also at University of Shanghai for Science and Technology, Shanghai, China

¹⁴Now at The University of Iowa, Iowa City, Iowa, USA

¹⁵Also at Center for High Energy Physics, Peking University, Beijing, China

¹⁶Also at Suez University, Suez, Egypt

¹⁷Now at British University in Egypt, Cairo, Egypt

¹⁸Also at Cairo University, Cairo, Egypt

¹⁹Also at Purdue University, West Lafayette, Indiana, USA

²⁰Also at Université de Haute Alsace, Mulhouse, France

²¹Also at Istinye University, Istanbul, Turkey

²²Also at an institute formerly covered by a cooperation agreement with CERN

²³Also at University of Hamburg, Hamburg, Germany

²⁴Also at RWTH Aachen University, III. Physikalisches Institut A, Aachen, Germany

²⁵Also at Bergische University Wuppertal (BUW), Wuppertal, Germany

²⁶Also at Brandenburg University of Technology, Cottbus, Germany

²⁷Also at Forschungszentrum Jülich, Juelich, Germany

²⁸Also at CERN, European Organization for Nuclear Research, Geneva, Switzerland

²⁹Also at HUN-REN ATOMKI - Institute of Nuclear Research, Debrecen, Hungary

³⁰Now at Universitatea Babeş-Bolyai - Facultatea de Fizica, Cluj-Napoca, Romania

³¹Also at MTA-ELTE Lendület CMS Particle and Nuclear Physics Group, Eötvös Loránd University, Budapest, Hungary

³²Also at HUN-REN Wigner Research Centre for Physics, Budapest, Hungary

³³Also at Physics Department, Faculty of Science, Assiut University, Assiut, Egypt

³⁴Also at The University of Kansas, Lawrence, Kansas, USA

³⁵Also at Punjab Agricultural University, Ludhiana, India

³⁶Also at University of Hyderabad, Hyderabad, India

³⁷Also at Indian Institute of Science (IISc), Bangalore, India

³⁸Also at University of Visva-Bharati, Santiniketan, India

³⁹Also at IIT Bhubaneswar, Bhubaneswar, India

⁴⁰Also at Institute of Physics, Bhubaneswar, India

- ⁴¹Also at Deutsches Elektronen-Synchrotron, Hamburg, Germany
- ⁴²Also at Isfahan University of Technology, Isfahan, Iran
- ⁴³Also at Sharif University of Technology, Tehran, Iran
- ⁴⁴Also at Department of Physics, University of Science and Technology of Mazandaran, Behshahr, Iran
- ⁴⁵Also at Department of Physics, Faculty of Science, Arak University, ARAK, Iran
- ⁴⁶Also at Helwan University, Cairo, Egypt
- ⁴⁷Also at Italian National Agency for New Technologies, Energy and Sustainable Economic Development, Bologna, Italy
- ⁴⁸Also at Centro Siciliano di Fisica Nucleare e di Struttura Della Materia, Catania, Italy
- ⁴⁹Also at Università degli Studi Guglielmo Marconi, Roma, Italy
- ⁵⁰Also at Scuola Superiore Meridionale, Università di Napoli 'Federico II', Napoli, Italy
- ⁵¹Also at Fermi National Accelerator Laboratory, Batavia, Illinois, USA
- ⁵²Also at Lulea University of Technology, Lulea, Sweden
- ⁵³Also at Consiglio Nazionale delle Ricerche - Istituto Officina dei Materiali, Perugia, Italy
- ⁵⁴Also at UPES - University of Petroleum and Energy Studies, Dehradun, India
- ⁵⁵Also at Institut de Physique des 2 Infinis de Lyon (IP2I), Villeurbanne, France
- ⁵⁶Also at Department of Applied Physics, Faculty of Science and Technology, Universiti Kebangsaan Malaysia, Bangi, Malaysia
- ⁵⁷Also at Trincomalee Campus, Eastern University, Sri Lanka, Nilaveli, Sri Lanka
- ⁵⁸Also at Saegis Campus, Nugegoda, Sri Lanka
- ⁵⁹Also at National and Kapodistrian University of Athens, Athens, Greece
- ⁶⁰Also at Ecole Polytechnique Fédérale Lausanne, Lausanne, Switzerland
- ⁶¹Also at Universität Zürich, Zurich, Switzerland
- ⁶²Also at Stefan Meyer Institute for Subatomic Physics, Vienna, Austria
- ⁶³Also at Near East University, Research Center of Experimental Health Science, Mersin, Turkey
- ⁶⁴Also at Konya Technical University, Konya, Turkey
- ⁶⁵Also at Izmir Bakircay University, Izmir, Turkey
- ⁶⁶Also at Adiyaman University, Adiyaman, Turkey
- ⁶⁷Also at Bozok Universiteleri Rektörlüğü, Yozgat, Turkey
- ⁶⁸Also at Istanbul Sabahattin Zaim University, Istanbul, Turkey
- ⁶⁹Also at Marmara University, Istanbul, Turkey
- ⁷⁰Also at Milli Savunma University, Istanbul, Turkey
- ⁷¹Also at Informatics and Information Security Research Center, Gebze/Kocaeli, Turkey
- ⁷²Also at Kafkas University, Kars, Turkey
- ⁷³Now at Istanbul Okan University, Istanbul, Turkey
- ⁷⁴Also at Hacettepe University, Ankara, Turkey
- ⁷⁵Also at Erzincan Binali Yildirim University, Erzincan, Turkey
- ⁷⁶Also at Istanbul University - Cerrahpasa, Faculty of Engineering, Istanbul, Turkey
- ⁷⁷Also at Yildiz Technical University, Istanbul, Turkey
- ⁷⁸Also at School of Physics and Astronomy, University of Southampton, Southampton, United Kingdom
- ⁷⁹Also at Monash University, Faculty of Science, Clayton, Australia
- ⁸⁰Also at Bethel University, St. Paul, Minnesota, USA
- ⁸¹Also at Università di Torino, Torino, Italy
- ⁸²Also at Karamanoğlu Mehmetbey University, Karaman, Turkey
- ⁸³Also at California Lutheran University, Thousand Oaks, California, USA
- ⁸⁴Also at California Institute of Technology, Pasadena, California, USA
- ⁸⁵Also at United States Naval Academy, Annapolis, Maryland, USA
- ⁸⁶Also at Bingol University, Bingol, Turkey
- ⁸⁷Also at Georgian Technical University, Tbilisi, Georgia
- ⁸⁸Also at Sinop University, Sinop, Turkey
- ⁸⁹Also at Erciyes University, Kayseri, Turkey
- ⁹⁰Also at Horia Hulubei National Institute of Physics and Nuclear Engineering (IFIN-HH), Bucharest, Romania
- ⁹¹Now at another institute formerly covered by a cooperation agreement with CERN
- ⁹²Also at Hamad Bin Khalifa University (HBKU), Doha, Qatar

⁹³Also at another institute formerly covered by a cooperation agreement with CERN

⁹⁴Also at Yerevan Physics Institute, Yerevan, Armenia

⁹⁵Also at Imperial College, London, United Kingdom

⁹⁶Also at Institute of Nuclear Physics of the Uzbekistan Academy of Sciences, Tashkent, Uzbekistan