

Erratum: Prog. Theor. Exp. Phys. **2019**, 123C01 (2019)

The Belle II Physics Book

E. Kou^{75,*,\$,†}, P. Urquijo^{145,‡,†}, W. Altmannshofer^{135,\$}, F. Beaujean^{79,\$}, G. Bell^{122,\$}, M. Beneke^{114,\$}, I. I. Bigi^{148,\$}, F. Bishara^{150,16,\$}, M. Blanke^{49,51,\$}, C. Bobeth^{113,114,\$}, M. Bona^{152,\$}, N. Brambilla^{114,\$}, V. M. Braun^{50,\$}, J. Brod^{112,135,\$}, A. J. Buras^{115,\$}, H. Y. Cheng^{43,\$}, C. W. Chiang^{92,\$}, M. Ciuchini^{59,\$}, G. Colangelo^{128,\$}, A. Crivellin^{102,\$}, H. Czyz^{156,29,\$}, A. Datta^{146,\$}, F. De Fazio^{53,\$}, T. Deppisch^{51,\$}, M. J. Dolan^{145,\$}, J. Evans^{135,\$}, S. Fajfer^{109,141,\$}, T. Feldmann^{122,\$}, S. Godfrey^{7,\$}, M. Gronau^{62,\$}, Y. Grossman^{15,\$}, F. K. Guo^{45,134,\$}, U. Haisch^{150,11,\$}, C. Hanhart^{21,\$}, S. Hashimoto^{30,26,\$}, S. Hirose^{89,\$}, J. Hisano^{89,90,\$}, L. Hofer^{127,\$}, M. Hoferichter^{168,\$}, W. S. Hou^{92,\$}, T. Huber^{122,\$}, T. Hurth^{63,\$}, S. Jaeger^{159,\$}, S. Jahn^{83,\$}, M. Jamin^{126,\$}, J. Jones^{104,\$}, M. Jung^{113,\$}, A. L. Kagan^{135,\$}, F. Kahlhoefer^{1,\$}, J. F. Kamenik^{109,141,\$}, T. Kaneko^{30,26,\$}, Y. Kiyo^{64,\$}, A. Kokulu^{114,140,\$}, N. Kosnik^{109,141,\$}, A. S. Kronfeld^{20,\$}, Z. Ligeti^{19,\$}, H. Logan^{7,\$}, C. D. Lu^{41,\$}, V. Lubicz^{153,\$}, F. Mahmoudi^{142,\$}, K. Maltman^{173,\$}, S. Mishima^{30,\$}, M. Misiak^{166,\$}, K. Moats^{7,\$}, B. Moussallam^{74,\$}, A. Nefediev^{39,88,77,\$}, U. Nierste^{51,\$}, D. Nomura^{30,\$}, N. Offen^{50,\$}, S. L. Olsen^{133,\$}, E. Passemar^{37,118,\$}, A. Paul^{16,31,\$}, G. Paz^{170,\$}, A. A. Petrov^{170,\$}, A. Pich^{164,\$}, A. D. Polosa^{58,\$}, J. Pradler^{40,\$}, S. Prelovsek^{109,141,50,\$}, M. Procura^{123,\$}, G. Ricciardi^{54,\$}, D. J. Robinson^{132,19,\$}, P. Roig^{9,\$}, J. Rosiek^{166,\$}, S. Schacht^{60,15,\$}, K. Schmidt-Hoberg^{16,\$}, J. Schwichtenberg^{51,\$}, S. R. Sharpe^{167,\$}, J. Shigemitsu^{117,\$}, D. Shih^{105,\$}, N. Shimizu^{162,\$}, Y. Shimizu^{69,\$}, L. Silvestrini^{58,\$}, S. Simula^{59,\$}, C. Smith^{76,\$}, P. Stoffer^{131,\$}, D. Straub^{113,\$}, F. J. Tackmann^{16,\$}, M. Tanaka^{98,\$}, A. Tayduganov^{112,\$}, G. Tetlalmatzi-Xolocotzi^{95,\$}, T. Teubner^{140,\$}, A. Vairo^{114,\$}, D. van Dyk^{114,\$}, J. Virto^{82,114,\$}, Z. Was^{93,\$}, R. Watanabe^{147,\$}, I. Watson^{155,\$}, S. Westhoff^{139,\$}, J. Zupan^{135,\$}, R. Zwicky^{136,\$}, F. Abudinén^{83,‡}, I. Adachi^{30,26,‡}, K. Adamczyk^{93,‡}, P. Ahlburg^{129,‡}, H. Aihara^{162,‡}, A. Aloisio^{54,‡}, L. Andricek^{84,‡}, N. Anh Ky^{44,‡}, M. Arndt^{129,‡}, D. M. Asner^{5,‡}, H. Atmacan^{158,‡}, T. Aushev^{87,‡}, V. Aushev^{110,‡}, R. Ayad^{161,‡}, T. Aziz^{111,‡}, S. Baehr^{48,‡}, S. Bahinipati^{33,‡}, P. Bambade^{75,‡}, Y. Ban^{103,‡}, M. Barrett^{170,‡}, J. Baudot^{47,‡}, P. Behera^{36,‡}, K. Belous^{38,‡}, M. Bender^{78,‡}, J. Bennett^{8,‡}, M. Berger^{40,‡}, E. Bernieri^{59,‡}, F. U. Bernlochner^{48,‡}, M. Bessner^{138,‡}, D. Besson^{88,‡}, S. Bettarini^{57,‡}, V. Bhardwaj^{32,‡}, B. Bhuyan^{34,‡}, T. Bilka^{10,‡}, S. Bilmis^{86,‡}, S. Bilokin^{47,‡}, G. Bonvicini^{170,‡}, A. Bozek^{93,‡}, M. Bračko^{144,109,‡}, P. Branchini^{59,‡}, N. Braun^{48,‡}, R. A. Briere^{8,‡}, T. E. Browder^{138,‡}, L. Burmistrov^{75,‡}, S. Bussino^{59,‡}, L. Cao^{48,‡}, G. Caria^{145,‡}, G. Casarosa^{57,‡}, C. Cecchi^{56,‡}, D. Červenkov^{10,‡}, M.-C. Chang^{22,‡}, P. Chang^{92,‡}, R. Cheaib^{146,‡}, V. Chekelian^{83,‡}, Y. Chen^{154,‡}, B. G. Cheon^{28,‡}, K. Chilikin^{77,‡}, K. Cho^{70,‡}, J. Choi^{14,‡}, S.-K. Choi^{27,‡}, S. Choudhury^{35,‡}, D. Cinabro^{170,‡}, L. M. Cremaldi^{146,‡}, D. Cuesta^{47,‡},

†Editor.

‡Belle II Collaborator.

§Theory or external contributing author.

S. Cunliffe^{16,‡}, N. Dash^{33,‡}, E. de la Cruz Burelo^{9,‡}, E. de Lucia^{52,‡}, G. De Nardo^{54,‡}, M. De Nuccio^{16,‡}, G. De Pietro^{59,‡}, A. De Yta Hernandez^{9,‡}, B. Deschamps^{129,‡}, M. Destefanis^{60,‡}, S. Dey^{116,‡}, F. Di Capua^{54,‡}, S. Di Carlo^{75,‡}, J. Dingfelder^{129,‡}, Z. Doležal^{10,‡}, I. Domínguez Jiménez^{125,‡}, T. V. Dong^{30,26,‡}, D. Dossett^{145,‡}, S. Duell^{129,‡}, S. Eidelman^{6,96,77,‡}, D. Epifanov^{6,96,‡}, J. E. Fast^{100,‡}, T. Ferber^{16,‡}, S. Fiore^{18,‡}, A. Fodor^{85,‡}, F. Forti^{57,‡}, A. Frey^{24,‡}, O. Frost^{16,‡}, B. G. Fulsom^{100,‡}, M. Gabriel^{83,‡}, N. Gabyshev^{6,96,‡}, E. Ganiev^{61,‡}, X. Gao^{3,‡}, B. Gao^{23,‡}, R. Garg^{101,‡}, A. Garmash^{6,96,‡}, V. Gaur^{169,‡}, A. Gaz^{90,‡}, T. Geßler^{65,‡}, U. Gebauer^{24,‡}, M. Gelb^{48,‡}, A. Gellrich^{16,‡}, D. Getzkow^{65,‡}, R. Giordano^{54,‡}, A. Giri^{35,‡}, A. Glazov^{16,‡}, B. Gobbo^{61,‡}, R. Godang^{157,‡}, O. Gogota^{110,‡}, P. Goldenzweig^{48,‡}, B. Golob^{141,109,‡}, W. Gradl^{63,‡}, E. Graziani^{59,‡}, M. Greco^{60,‡}, D. Greenwald^{114,‡}, S. Griбанov^{6,96,‡}, Y. Guan^{17,‡}, E. Guido^{60,‡}, A. Guo^{41,‡}, S. Halder^{111,‡}, K. Hara^{30,26,‡}, O. Hartbrich^{138,‡}, T. Hauth^{48,‡}, K. Hayasaka^{94,‡}, H. Hayashii^{91,‡}, C. Hearty^{130,‡}, I. Heredia De La Cruz^{9,‡}, M. Hernandez Villanueva^{9,‡}, A. Hershenhorn^{130,‡}, T. Higuchi^{66,‡}, M. Hoek^{63,‡}, S. Hollitt^{124,‡}, N. T. Hong Van^{44,‡}, C.-L. Hsu^{160,‡}, Y. Hu^{41,‡}, K. Huang^{92,‡}, T. Iijima^{89,90,‡}, K. Inami^{90,‡}, G. Inguglia^{40,‡}, A. Ishikawa^{119,‡}, R. Itoh^{30,26,‡}, Y. Iwasaki^{30,‡}, M. Iwasaki^{97,‡}, P. Jackson^{124,‡}, W. W. Jacobs^{37,‡}, I. Jaegle^{137,‡}, H. B. Jeon^{73,‡}, X. Ji^{41,‡}, S. Jia^{3,‡}, Y. Jin^{162,‡}, C. Joo^{66,‡}, M. Künzel^{16,‡}, I. Kadenko^{110,‡}, J. Kahn^{78,‡}, H. Kakuno^{121,‡}, A. B. Kaliyar^{36,‡}, J. Kandra^{10,‡}, K. H. Kang^{73,‡}, Y. Kato^{90,‡}, T. Kawasaki^{68,‡}, C. Ketter^{138,‡}, M. Khasmidatul^{143,‡}, H. Kichimi^{30,‡}, J. B. Kim^{71,‡}, K. T. Kim^{71,‡}, H. J. Kim^{73,‡}, D. Y. Kim^{108,‡}, K. Kim^{172,‡}, Y. Kim^{172,‡}, T. D. Kimmel^{169,‡}, H. Kindo^{30,26,‡}, K. Kinoshita^{135,‡}, T. Konno^{68,‡}, A. Korobov^{6,96,‡}, S. Korpar^{144,109,‡}, D. Kotchetkov^{138,‡}, R. Kowalewski^{165,‡}, P. Križan^{141,109,‡}, R. Kroeger^{146,‡}, J.-F. Krohn^{145,‡}, P. Krokovny^{6,96,‡}, W. Kuehn^{65,‡}, T. Kuhr^{78,‡}, R. Kulasiri^{67,‡}, M. Kumar^{81,‡}, R. Kumar^{101,‡}, T. Kumita^{121,‡}, A. Kuzmin^{6,96,‡}, Y.-J. Kwon^{172,‡}, S. Lacaprara^{55,‡}, Y.-T. Lai^{30,‡}, K. Lalwani^{81,‡}, J. S. Lange^{65,‡}, S. C. Lee^{73,‡}, J. Y. Lee^{106,‡}, P. Leitl^{83,‡}, D. Levit^{114,‡}, S. Levonian^{16,‡}, S. Li^{3,‡}, L. K. Li^{41,‡}, Y. Li^{41,‡}, Y. B. Li^{103,‡}, Q. Li^{103,‡}, L. Li Gioi^{83,‡}, J. Libby^{36,‡}, Z. Liptak^{138,‡}, D. Liventsev^{169,‡}, S. Longo^{165,‡}, A. Loos^{158,‡}, G. Lopez Castro^{9,‡}, M. Lubej^{109,‡}, T. Lueck^{57,‡}, F. Luetticke^{129,‡}, T. Luo^{23,‡}, F. Müller^{16,‡}, Th. Müller^{48,‡}, C. MacQueen^{145,‡}, Y. Maeda^{90,‡}, M. Maggiora^{60,‡}, S. Maity^{33,‡}, E. Manoni^{56,‡}, S. Marcello^{60,‡}, C. Marinas^{129,‡}, M. Martinez Hernandez^{4,‡}, A. Martini^{59,‡}, D. Matvienko^{6,96,77,‡}, J. A. McKenna^{130,‡}, F. Meier^{160,‡}, M. Merola^{54,‡}, F. Metzner^{48,‡}, C. Miller^{165,‡}, K. Miyabayashi^{91,‡}, H. Miyake^{30,26,‡}, H. Miyata^{94,‡}, R. Mizuk^{77,88,87,‡}, G. B. Mohanty^{111,163,‡}, H. K. Moon^{71,‡}, T. Moon^{106,‡}, A. Morda^{55,‡}, T. Morii^{66,‡}, M. Mrvar^{109,‡}, G. Muromiya^{90,‡}, R. Mussa^{60,‡}, I. Nakamura^{30,26,‡}, T. Nakano^{99,‡}, M. Nakao^{30,26,‡}, H. Nakayama^{30,26,‡}, H. Nakazawa^{92,‡}, T. Nanut^{109,‡}, M. Naruki^{72,‡}, K. J. Nath^{34,‡}, M. Nayak^{116,‡}, N. Nellikunnummel^{151,‡}, D. Neverov^{90,‡}, C. Niebuhr^{16,‡}, J. Ninkovic^{84,‡}, S. Nishida^{30,26,‡}, K. Nishimura^{138,‡}, M. Nouxman^{143,‡}, G. Nowak^{93,‡}, K. Ogawa^{94,‡}, Y. Onishchuk^{110,‡}, H. Ono^{94,‡}, Y. Onuki^{162,‡}, P. Pakhlov^{77,88,‡}, G. Pakhlova^{87,‡}, B. Pal^{5,‡}, E. Paoloni^{57,‡}, H. Park^{73,‡}, C.-S. Park^{172,‡}, B. Paschen^{129,‡}, A. Passeri^{59,‡}, S. Paul^{114,‡}, T. K. Pedlar^{80,‡}, M. Perelló^{46,‡}, I. M. Peruzzi^{52,‡}, R. Pestotnik^{109,‡}, L. E. Piilonen^{169,‡}, L. Podesta Lerma^{125,‡}, V. Popov^{87,‡}, K. Prasanth^{111,‡}, E. Prencipe^{21,‡}, M. Prim^{48,‡}, M. V. Purohit^{158,‡}, A. Rabusov^{114,‡}, R. Rasheed^{47,‡}, S. Reiter^{65,‡}, M. Remnev^{6,96,‡}, P. K. Resmi^{36,‡}, I. Ripp-Baudot^{47,‡}, M. Ritter^{78,‡}, M. Ritzert^{139,‡}, G. Rizzo^{57,‡}, L. Rizzuto^{141,109,‡}, S. H. Robertson^{85,‡}, D. Rodriguez Perez^{125,‡}, J. M. Roney^{165,‡}, C. Rosenfeld^{158,‡}, A. Rostomyan^{16,‡}, N. Rout^{36,‡}, S. Rummel^{78,‡}, G. Russo^{54,‡}, D. Sahoo^{111,‡}, Y. Sakai^{30,26,‡}, M. Salehi^{143,78,‡}, D. A. Sanders^{146,‡}, S. Sandilya^{135,‡}, A. Sangal^{135,‡}, L. Santelj^{47,‡}, J. Sasaki^{162,‡}, Y. Sato^{30,‡}, V. Savinov^{151,‡}, B. Scavino^{63,‡}, M. Schram^{100,‡}, H. Schreeck^{24,‡}, J. Schueler^{138,‡}, C. Schwanda^{40,‡}, A. J. Schwartz^{135,‡}, R. M. Seddon^{85,‡}, Y. Seino^{94,‡}, K. Senyo^{171,‡}, O. Seon^{90,‡}, I. S. Seong^{138,‡}, M. E. Seviar^{145,‡}, C. Sfienti^{63,‡}, M. Shapkin^{38,‡},

C. P. Shen^{3,‡}, M. Shimomura^{91,‡}, J.-G. Shiu^{92,‡}, B. Shwartz^{6,96,‡}, A. Sibidanov^{165,‡}, F. Simon^{83,113,‡}, J. B. Singh^{101,‡}, R. Sinha^{42,‡}, S. Skambraks^{83,‡}, K. Smith^{145,‡}, R. J. Sobie^{165,‡}, A. Soffer^{116,‡}, A. Sokolov^{38,‡}, E. Solovieva^{77,87,‡}, B. Spruck^{63,‡}, S. Stanić^{149,‡}, M. Starić^{109,‡}, N. Starinsky^{147,‡}, U. Stolzenberg^{24,‡}, Z. Stottler^{169,‡}, R. Stroili^{55,‡}, J. F. Strube^{100,‡}, J. Stypula^{93,‡}, M. Sumihama^{25,‡}, K. Sumisawa^{30,26,‡}, T. Sumiyoshi^{121,‡}, D. Summers^{146,‡}, W. Sutcliffe^{48,‡}, S. Y. Suzuki^{30,26,‡}, M. Tabata^{13,‡}, M. Takahashi^{16,‡}, M. Takizawa^{107,‡}, U. Tamponi^{60,‡}, J. Tan^{145,‡}, S. Tanaka^{30,26,‡}, K. Tanida^{2,‡}, N. Taniguchi^{30,‡}, Y. Tao^{137,‡}, P. Taras^{147,‡}, G. Tejada Munoz^{4,‡}, F. Tenchini^{16,‡}, U. Tippawan^{12,‡}, E. Torassa^{55,‡}, K. Trabelsi^{30,26,‡}, T. Tsuboyama^{30,26,‡}, M. Uchida^{120,‡}, S. Uehara^{30,26,‡}, T. Uglov^{77,87,‡}, Y. Unno^{28,‡}, S. Uno^{30,26,‡}, Y. Ushiroda^{30,26,162,‡}, Y. Usov^{6,96,‡}, S. E. Vahsen^{138,‡}, R. van Tonder^{48,‡}, G. Varner^{138,‡}, K. E. Varvell^{160,‡}, A. Vinokurova^{6,96,‡}, L. Vitale^{61,‡}, M. Vos^{46,‡}, A. Vossen^{17,‡}, E. Waheed^{145,‡}, H. Wakeling^{85,‡}, K. Wan^{162,‡}, M.-Z. Wang^{92,‡}, X. L. Wang^{23,‡}, B. Wang^{135,‡}, A. Warburton^{85,‡}, J. Webb^{145,‡}, S. Wehle^{16,‡}, C. Wessel^{129,‡}, J. Wiechczynski^{93,‡}, P. Wieduwilt^{24,‡}, E. Won^{71,‡}, Q. Xu^{41,‡}, X. Xu^{41,‡}, B. D. Yabsley^{160,‡}, S. Yamada^{30,‡}, H. Yamamoto^{119,‡}, W. Yan^{3,‡}, W. Yan^{154,‡}, S. B. Yang^{71,‡}, H. Ye^{16,‡}, I. Yeo^{70,‡}, J. H. Yin^{41,‡}, M. Yonenaga^{121,‡}, T. Yoshinobu^{94,‡}, W. Yuan^{55,‡}, C. Z. Yuan^{41,‡}, Y. Yusa^{94,‡}, S. Zakharov^{77,87,‡}, L. Zani^{57,‡}, M. Zeyrek^{86,‡}, J. Zhang^{41,‡}, Y. Zhang^{23,‡}, Y. Zhang^{154,‡}, X. Zhou^{3,‡}, V. Zhukova^{77,‡}, V. Zhulanov^{6,96,‡}, and A. Zupanc^{141,109,‡}

¹RWTH, Aachen University, D-52056 Aachen, Germany

²Advanced Science Research Center, Japan Atomic Energy Agency, Naka 319-1195, Japan

³Beihang University, Beijing 100191, China

⁴Benemerita Universidad Autonoma de Puebla, Puebla 72570, Mexico

⁵Brookhaven National Laboratory, Upton, New York 11973, USA

⁶Budker Institute of Nuclear Physics SB RAS, Novosibirsk 630090, Russian Federation

⁷Ottawa-Carleton Institute of Physics, Department of Physics, Carleton University, Ontario K1S 5B6, Canada

⁸Carnegie Mellon University, Pittsburgh, Pennsylvania 15213, USA

⁹Centro de Investigacion y de Estudios Avanzados del Instituto Politecnico Nacional, Mexico City 07360, Mexico

¹⁰Faculty of Mathematics and Physics, Charles University, 121 16 Prague, Czech Republic

¹¹CERN, Theoretical Physics Department, CH-1211 Geneva 23, Switzerland

¹²Chiang Mai University, Chiang Mai 50202, Thailand

¹³Chiba University, Chiba 263-8522, Japan

¹⁴Chonnam National University, Kwangju 660-701, South Korea

¹⁵Department of Physics, LEPP, Cornell University, Ithaca, NY 14853, USA

¹⁶Deutsches Elektronen-Synchrotron, 22607 Hamburg, Germany

¹⁷Duke University, Durham, North Carolina 27708, USA

¹⁸ENEA Casaccia, I-00123 Roma, Italy

¹⁹Ernest Orlando Lawrence Berkeley National Laboratory, University of California, Berkeley, CA 94720, USA

²⁰Theoretical Physics Department, Fermi National Accelerator Laboratory, Batavia, IL 60510, USA

²¹Forschungszentrum Jülich, 52425 Jülich, Germany

²²Department of Physics, Fu Jen Catholic University, Taipei 24205, Taiwan

²³Key Laboratory of Nuclear Physics and Ion-beam Application (MOE) and Institute of Modern Physics, Fudan University, Shanghai 200443, China

²⁴II. Physikalisches Institut, Georg-August-Universität Göttingen, 37073 Göttingen, Germany

²⁵Gifu University, Gifu 501-1193, Japan

²⁶The Graduate University for Advanced Studies (SOKENDAI), Hayama 240-0193, Japan

²⁷Gyeongsang National University, Chinju 660-701, South Korea

²⁸Hanyang University, Seoul 133-791, South Korea

²⁹Helmholtz-Institute 55128 Mainz, Germany

³⁰High Energy Accelerator Research Organization (KEK), Tsukuba 305-0801, Japan

- ³¹*Institut für Physik, Humboldt-Universität zu Berlin, D-12489 Berlin, Germany*
- ³²*Indian Institute of Science Education and Research Mohali, SAS Nagar, 140306, India*
- ³³*Indian Institute of Technology Bhubaneswar, Satya Nagar 751007, India*
- ³⁴*Indian Institute of Technology Guwahati, Assam 781039, India*
- ³⁵*Indian Institute of Technology Hyderabad, Telangana 502285, India*
- ³⁶*Indian Institute of Technology Madras, Chennai 600036, India*
- ³⁷*Indiana University, Bloomington, Indiana 47408, USA*
- ³⁸*Institute for High Energy Physics, Protvino 142281, Russian Federation*
- ³⁹*Institute for Theoretical and Experimental Physics, B. Chermushkinskaya 25, 117218 Moscow, Russia*
- ⁴⁰*Institute of High Energy Physics, Vienna 1050, Austria*
- ⁴¹*Institute of High Energy Physics, Chinese Academy of Sciences, Beijing 100049, China*
- ⁴²*Institute of Mathematical Sciences, Chennai 600113, India*
- ⁴³*Institute of Physics, Academia Sinica Taipei, Taiwan 115, Republic of China*
- ⁴⁴*Institute of Physics, VAST, Hanoi, Vietnam*
- ⁴⁵*Institute of Theoretical Physics, Chinese Academy of Sciences, Beijing 100190, China*
- ⁴⁶*Instituto de Fisica Corpuscular, Paterna 46980, Spain*
- ⁴⁷*Institut Pluridisciplinaire Hubert Curien, Strasbourg 67037, France*
- ⁴⁸*Institut für Experimentelle Teilchenphysik, Karlsruhe Institute of Technology, 76131 Karlsruhe, Germany*
- ⁴⁹*Institut für Kernphysik, Karlsruhe Institute of Technology, Hermann-von-Helmholtz-Platz 1, D-76344 Eggenstein-Leopoldshafen, Germany*
- ⁵⁰*Institut für Theoretische Physik, Universität Regensburg, D-93040 Regensburg, Germany*
- ⁵¹*Institut für Theoretische Teilchenphysik, Karlsruhe Institute of Technology, Wolfgang-Gaede-Str. 1, D-76131 Karlsruhe, Germany*
- ⁵²*INFN Laboratori Nazionali di Frascati, I-00044 Frascati, Italy*
- ⁵³*INFN Sezione di Bari, Via Orabona 4, I-70126 Bari, Italy*
- ⁵⁴*INFN Sezione di Napoli and Dipartimento di Scienze Fisiche, Università di Napoli Federico II, I-80126 Napoli, Italy*
- ⁵⁵*INFN Sezione di Padova and Dipartimento di Fisica, Università di Padova, I-35131 Padova, Italy*
- ⁵⁶*INFN Sezione di Perugia and Dipartimento di Fisica, Università di Perugia, I-06123 Perugia, Italy*
- ⁵⁷*INFN Sezione di Pisa and Dipartimento di Fisica, Università di Pisa, I-56127 Pisa, Italy*
- ⁵⁸*INFN Sezione di Roma and Università di Roma "La Sapienza", I-00185 Roma, Italy*
- ⁵⁹*INFN Sezione di Roma Tre and Università di Roma Tre, I-00146 Roma, Italy*
- ⁶⁰*INFN Sezione di Torino and Dipartimento di Fisica, Università di Torino, I-10125 Torino, Italy*
- ⁶¹*INFN Sezione di Trieste and Dipartimento di Fisica, Università di Trieste, I-34127 Trieste, Italy*
- ⁶²*Physics Department, Technion, Israel Institute of Technology, 32000 Haifa, Israel*
- ⁶³*Johannes Gutenberg-Universität Mainz, Institut für Kernphysik, D-55099 Mainz, Germany*
- ⁶⁴*Department of Physics, Juntendo University, Inzai, Chiba 270-1695, Japan*
- ⁶⁵*Justus-Liebig-Universität Gießen, 35392 Gießen, Germany*
- ⁶⁶*Kavli Institute for the Physics and Mathematics of the Universe (WPI), University of Tokyo, Kashiwa 277-8583, Japan*
- ⁶⁷*Kennesaw State University, Kennesaw, Georgia 30144, USA*
- ⁶⁸*Kitasato University, Tokyo 108-0072, Japan*
- ⁶⁹*Kogakuin University, 2665-1 Nakano, Hachioji, Tokyo 192-0015, Japan*
- ⁷⁰*Korea Institute of Science and Technology Information, Daejeon 305-806, South Korea*
- ⁷¹*Korea University, Seoul 136-713, South Korea*
- ⁷²*Kyoto University, Kyoto 606-8502, Japan*
- ⁷³*Kyungpook National University, Daegu 702-701, South Korea*
- ⁷⁴*L'institut de physique nucléaire d'Orsay, IN2P3/CNRS et Université Paris-Sud 11, Centre Scientifique d'Orsay, F-91898 Orsay Cedex, France*
- ⁷⁵*Laboratoire de l'Accélérateur Linéaire, IN2P3/CNRS et Université Paris-Sud 11, Centre Scientifique d'Orsay, F-91898 Orsay Cedex, France*
- ⁷⁶*Laboratoire de Physique Subatomique et Cosmologie, IN2P3/CNRS et Université Grenoble Alpes, 38000 Grenoble, France*
- ⁷⁷*P.N. Lebedev Physical Institute of the Russian Academy of Sciences, Moscow 119991, Russian Federation*
- ⁷⁸*Ludwig Maximilians University, 80539 Munich, Germany*
- ⁷⁹*Excellence Cluster Universe, Ludwig Maximilians University, 80539 Munich, Germany*

- ⁸⁰Luther College, Decorah, Iowa 52101, USA
- ⁸¹Malaviya National Institute of Technology Jaipur, Jaipur 302017, India
- ⁸²Center for Theoretical Physics, Massachusetts Institute of Technology, Cambridge, MA 02139, USA
- ⁸³Max-Planck-Institut für Physik, 80805 München, Germany
- ⁸⁴Semiconductor Laboratory of the Max Planck Society, Max-Planck-Institut für Physik, 81739 München, Germany
- ⁸⁵McGill University, Montréal, Québec, H3A 2T8, Canada
- ⁸⁶Middle East Technical University, 06531 Ankara, Turkey
- ⁸⁷Moscow Institute of Physics and Technology, Moscow Region 141700, Russian Federation
- ⁸⁸Moscow Physical Engineering Institute, Moscow 115409, Russian Federation
- ⁸⁹Kobayashi-Maskawa Institute, Nagoya University, Nagoya 464-8602, Japan
- ⁹⁰Graduate School of Science, Nagoya University, Nagoya 464-8602, Japan
- ⁹¹Nara Women's University, Nara 630-8506, Japan
- ⁹²Department of Physics, National Taiwan University, Taipei 10617, Taiwan
- ⁹³H. Niewodniczanski Institute of Nuclear Physics, Krakow 31-342, Poland
- ⁹⁴Niigata University, Niigata 950-2181, Japan
- ⁹⁵Nikhef, Science Park 105, NL-1098 XG Amsterdam, Netherlands
- ⁹⁶Novosibirsk State University, Novosibirsk 630090, Russian Federation
- ⁹⁷Osaka City University, Osaka 558-8585, Japan
- ⁹⁸Department of Physics, Graduate School of Science, Osaka University, Toyonaka, Osaka 560-0043, Japan
- ⁹⁹Research Center for Nuclear Physics, Osaka University, Osaka 567-0047, Japan
- ¹⁰⁰Pacific Northwest National Laboratory, Richland, Washington 99352, USA
- ¹⁰¹Panjab University, Chandigarh 160014, India
- ¹⁰²Paul Scherrer Institut, CH-5232 Villigen PSI, Switzerland
- ¹⁰³Peking University, Beijing 100871, China
- ¹⁰⁴Seccion Fisica, Departamento de Ciencias, Pontificia Universidad Catolica del Peru, Apartado 1761, Lima, Peru
- ¹⁰⁵NHETC, Rutgers University, Piscataway, NJ 08854 USA
- ¹⁰⁶Seoul National University, Seoul 151-742, South Korea
- ¹⁰⁷Showa Pharmaceutical University, Tokyo 194-8543, Japan
- ¹⁰⁸Soongsil University, Seoul 156-743, South Korea
- ¹⁰⁹J. Stefan Institute, 1000 Ljubljana, Slovenia
- ¹¹⁰Taras Shevchenko National University of Kyiv, Kiev, Ukraine
- ¹¹¹Tata Institute of Fundamental Research, Mumbai 400005, India
- ¹¹²Technische Universität Dortmund, Fakultät Physik, Otto-Hahn-Str. 4, D-44227 Dortmund, Germany
- ¹¹³Excellence Cluster Universe, Technische Universität München, 85748 Garching, Germany
- ¹¹⁴Department of Physics, Technische Universität München, 85748 Garching, Germany
- ¹¹⁵Institute for Advanced Study, Technische Universität München, Lichtenbergstr. 2a, D-85748 Garching
- ¹¹⁶Tel Aviv University, School of Physics and Astronomy, Tel Aviv, 69978, Israel
- ¹¹⁷The Ohio State University, Department of Physics, Columbus, OH 43210, USA
- ¹¹⁸Theory Center, Thomas Jefferson National Accelerator Facility, Newport News, VA 23606, USA
- ¹¹⁹Department of Physics, Tohoku University, Sendai 980-8578, Japan
- ¹²⁰Tokyo Institute of Technology, Tokyo 152-8550, Japan
- ¹²¹Tokyo Metropolitan University, Tokyo 192-0397, Japan
- ¹²²Theoretische Physik 1, Naturwissenschaftlich-Technische Fakultät, Universität Siegen, D-57068 Siegen, Germany
- ¹²³Fakultät für Physik, Universität Wien, Boltzmanngasse 5, Vienna 1090, Austria
- ¹²⁴Department of Physics, University of Adelaide, Adelaide, South Australia 5005, Australia
- ¹²⁵Universidad Autonoma de Sinaloa, Sinaloa 80000, Mexico
- ¹²⁶IFAE, Autonomous University of Barcelona, Spain
- ¹²⁷Departament de Física Quàntica i Astrofísica (FQA), Institut de Ciències del Cosmos (ICCUB), Universitat de Barcelona (UB), Spain
- ¹²⁸Albert Einstein Center for Fundamental Physics, Institute for Theoretical Physics, University of Bern, Sidlerstrasse 5, 3012 Bern, Switzerland
- ¹²⁹University of Bonn, 53115 Bonn, Germany
- ¹³⁰University of British Columbia, Vancouver, British Columbia, V6T 1Z1, Canada

- ¹³¹Department of Physics, University of California at San Diego, 9500 Gilman Drive, La Jolla, CA 92093-0319, USA
- ¹³²Santa Cruz Institute for Particle Physics and Department of Physics, University of California at Santa Cruz, Santa Cruz CA 95064, USA
- ¹³³University of the Chinese Academy of Science, Beijing, 100049, People's Republic of China
- ¹³⁴School of Physical Sciences, University of Chinese Academy of Sciences, Beijing 100049, China
- ¹³⁵University of Cincinnati, Cincinnati, Ohio 45221, USA
- ¹³⁶Higgs Centre For Theoretical Physics, School of Physics and Astronomy, University of Edinburgh, Edinburgh EH9 3JZ, Scotland
- ¹³⁷University of Florida, Gainesville, Florida 32611, USA
- ¹³⁸University of Hawaii, Honolulu, Hawaii 96822, USA
- ¹³⁹University of Heidelberg, 68131 Mannheim, Germany
- ¹⁴⁰Department of Mathematical Sciences, University of Liverpool, Liverpool L69 3BX, UK
- ¹⁴¹Faculty of Mathematics and Physics, University of Ljubljana, 1000 Ljubljana, Slovenia
- ¹⁴²Université Lyon 1, ENS de Lyon, CNRS, Centre de Recherche Astrophysique de Lyon UMR5574, F-69230 Saint-Genis-Laval, France
- ¹⁴³University of Malaya, 50603 Kuala Lumpur, Malaysia
- ¹⁴⁴University of Maribor, 2000 Maribor, Slovenia
- ¹⁴⁵School of Physics, The University of Melbourne, Victoria 3010, Australia
- ¹⁴⁶University of Mississippi, University, Mississippi 38677, USA
- ¹⁴⁷Université de Montréal, Physique des Particules, Montréal, Québec, H3C 3J7, Canada
- ¹⁴⁸Department of Physics, University of Notre Dame du Lac Notre Dame, IN 46556, USA
- ¹⁴⁹University of Nova Gorica, 5000 Nova Gorica, Slovenia
- ¹⁵⁰Rudolf Peierls Centre for Theoretical Physics, University of Oxford, OX1 3NP Oxford, UK
- ¹⁵¹University of Pittsburgh, Pittsburgh, Pennsylvania 15260, USA
- ¹⁵²Queen Mary University of London, School of Physics and Astronomy, Mile End Road, London E1 4NS, UK
- ¹⁵³Dipartimento di Matematica e Fisica, Università di Roma Tre, Via della Vasca Navale 84, I-00146 Roma, Italy
- ¹⁵⁴University of Science and Technology of China, Hefei 230026, China
- ¹⁵⁵University of Seoul, 130-743 Seoul, South Korea
- ¹⁵⁶Institute of Physics, University of Silesia, PL-41500 Chorzow, Poland
- ¹⁵⁷University of South Alabama, Mobile, Alabama 36688, USA
- ¹⁵⁸University of South Carolina, Columbia, South Carolina 29208, USA
- ¹⁵⁹Department of Physics and Astronomy, University of Sussex, Falmer, Brighton BN1 9QH, UK
- ¹⁶⁰School of Physics, University of Sydney, New South Wales 2006, Australia
- ¹⁶¹Department of Physics, Faculty of Science, University of Tabuk, Tabuk 71451, Saudi Arabia
- ¹⁶²Department of Physics, University of Tokyo, Tokyo 113-0033, Japan
- ¹⁶³Utkal University, Bhubaneswar 751004, India
- ¹⁶⁴IFIC, University of Valencia - CSIC, Spain
- ¹⁶⁵University of Victoria, Victoria, British Columbia, V8W 3P6, Canada
- ¹⁶⁶Institute of Theoretical Physics, Faculty of Physics, University of Warsaw, 02-093 Warsaw, Poland
- ¹⁶⁷Physics Department, University of Washington, Seattle WA 98195, USA
- ¹⁶⁸Institute for Nuclear Theory, University of Washington, Seattle, WA 98195-1550, USA
- ¹⁶⁹Virginia Polytechnic Institute and State University, Blacksburg, Virginia 24061, USA
- ¹⁷⁰Wayne State University, Detroit, Michigan 48202, USA
- ¹⁷¹Yamagata University, Yamagata 990-8560, Japan
- ¹⁷²Yonsei University, Seoul 120-749, South Korea
- ¹⁷³Department of Mathematics and Statistics, York University, Toronto, Ontario M3J 1P3, Canada
- *E-mail: kou@lal.in2p3.fr

Received January 21, 2020; Accepted January 21, 2020; Published February 28, 2020

In the original version of this manuscript, an error was introduced on pp352. '2.7nb:1.6nb' has been corrected to '2.4nb:1.3nb' in the current online and printed version.

doi:10.1093/ptep/ptz106