

María Vieites Díaz

Curriculum Vitae

Born in Ribadeo (Lugo) Spain, 11/06/1991
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EDUCATION AT UNIVERSIDADE DE SANTIAGO DE COMPOSTELA

2014-present: PhD in Nuclear and Particle Physics. Research topic: *Search for CP violation in $B_{(s)}^0$ mesons decays into light vector mesons at the LHCb experiment.* Degree expected in October 2018.

2013-2014: MSc in Nuclear and Particle Physics and their Technological and Medical Applications. MSc thesis: *Search and polarisation analysis of the $B^0 \rightarrow \rho^0 K^*(892)^0$ decay at the LHCb experiment.*

2009-2013: BSc in Physics. BSc thesis: *Study of b quark decays at LHCb ($B^+ \rightarrow \mu^+ \nu_\mu$).*

COMPLEMENTARY EDUCATION

2017, 28/08-06/09: CERN-FNAL Hadron Collider Physics Summer School, CERN (Switzerland).

2017, 16/06: LHCb Shift Leader Training, CERN.

2016, 15/06-28/06: European School of High-Energy Physics, Skeikampen (Norway).

2015, 22/04: LHCb Data Manager Training, CERN.

2015, 08/02-20/02: Fifth IDPASC School (International Doctorate Network in Particle Physics, Astrophysics and Cosmology), LPNHE-APC, Paris (France).

2014, 20/01-28/01: Fourth IDPASC School, Universidade do Minho, Braga (Portugal).

2012, 16/07-20/07: Frontiers of photonics and laser technologies, USC summer school, Santiago de Compostela (Spain).

RESEARCH EXPERIENCE

01/03/2015-present: Research Assistant at USC (Spain). Particle Physics Department, LHCb experiment: *Analysis of B meson decays into light vector mesons.*

22/06/2014-29/08/2014: Summer Student at CERN (Geneva). LHCb experiment: *Search for $H \rightarrow b\bar{b}$ decay in LHCb.*

04/11/2013-21/06/2014: Research Assistant at USC (Spain). Particle Physics Department, LHCb experiment: *Analysis of B meson decays into light vector mesons.*

16/07/2013-05/09/2013: Summer Student at DESY (Hamburg). CMS experiment: *Measurement of the top quark mass from $t\bar{t}$ events with additional jets.*

01/11/2012-30/06/2013: “Beca de colaboración” of the Ministry of Science and Competitiveness (Study Fellowship) at the Particle Physics Department of the USC: *Study of b quark decays at LHCb ($B^+ \rightarrow \mu^+ \nu_\mu$)*

AWARDS

05/08/2016: “Ayuda Formación Profesorado Universitario (FPU)” granted by the Spanish Government by competitive tendering for university teaching and research training during PhD studies. Awarded with 63342€.

29/06/2016: “Axuda Predoutoral”, granted by the Galician Government by competitive tendering for research training during PhD studies. Awarded with 70500€ . DOG núm. 122. *Declined August 4th 2016.*

30/05/2016: “Beca de la Fundación Barrié 2016”, granted by the Fundación Barrié by competitive tendering for funding predoctoral stays. Awarded with 6800 € for a 6 month stay at CERN.

2013: Bachelor Thesis awarded with the “IX Linguistic Quality Awards” in Galician language on the field of science, granted by the Universidade de Santiago de Compostela. Awarded with 300 €.

2012-2013: “Beca de colaboración” (Study Fellowship) at the Particle Physics department of the Universidade de Santiago de Compostela. Awarded with 2700 €.

2008-2009: Secondary School “Matrícula de Honor” (Honours), distinction awarded to the best 5% students. In the Spanish system, with this distinction, tuition fees are waived in the first year of university.

COLLABORATIVE RESPONSIBILITIES

BnoC LHCb WG Monte Carlo liaison from April 2016 to May 2018.

Experience as LHCb Data Manager (from October 2015) and **Shift Leader** (from June 2017).

Member of the local organising committee of the 81st external LHCb Collaboration week (12-16/09/2016) at Santiago de Compostela.

Experience in the VELO Testbeam at the SPS (from July 2015).

PUBLICATIONS

Member of the LHCb Collaboration since June 2013.

284 citeable papers (published or arXiv) on November 2018.

Among the papers by the LHCb collaboration, I was **proponent of the analyses** resulting in the following publications:

Measurement of the inelastic pp cross-section at a centre-of-mass energy of 13 TeV, [JHEP 06 \(2018\) 100](#).

First measurement of the CP-violating phase $\phi^{d\bar{s}}$ in $B_s^0 \rightarrow (K^+\pi^-)(K^-\pi^+)$ decays, [JHEP 03 \(2018\) 140](#).

Measurement of forward $t\bar{t}$, $W + b\bar{b}$ and $W + c\bar{c}$ production in pp collisions at $\sqrt{s}=8\text{TeV}$, [Phys. Lett. B767 \(2017\) 110](#).

Observation of the $B^0 \rightarrow \rho^0\rho^0$ decay from an amplitude analysis of $B^0 \rightarrow (\pi^+\pi^-)(\pi^+\pi^-)$ decays, [Phys.Lett. B747 \(2015\) 468-478](#).

Conference Proceedings:

$t\bar{t}$ Production in the forward region at LHCb, M. Vieites Díaz, (Moriond EW 2018 book in preparation).

CP violation measurements in b hadrons at LHCb, M. Vieites Díaz, DPF2017, [arXiv:1710.00091](#).

Charmless two- and four-body b -hadron decays at LHCb, M. Vieites Díaz, [PoS\(ICHEP2016\)536](#).

Resulting from my involvement in the **VELO upgrade program**, I am co-author (14 authors) of the paper *Development of a silicon bulk radiation damage model for Sentaurus TCAD*, published in [Nucl. Instrum. Methods Phys. Res., A 874 \(2017\) 94-102](#).

PRESENTATIONS IN PUBLIC SEMINARS AND CONFERENCES

LHCb: Time-integrated CPV, at the Workshop on the Implications of LHCb measurements and future prospects, CERN, 18/10/2018.

CPV measurements in B2VV decays at LHCb, on behalf of the LHCb collaboration, at the 10th International Workshop on the CKM Unitarity Triangle, Heidelberg (Germany), 18/09/2018.

$t\bar{t}$ production in the forward region at LHCb, on behalf of the LHCb Collaboration, at the YSF session from the 53rd Rencontres de Moriond (Electroweak) 2018 conference, La Thuile (Italy), 12/03/2018.

Lepton Flavour Universality Tests, on behalf of the LHCb group at the USC, at the 1st IGFAE (Instituto Galego de Física de Altas Enerxías) Retreat, Santiago de Compostela, 21/12/2017.

Charmless b -hadron decays (BnoC WG summary talk), on behalf of the BnoC PWG, at the 86th LHCb Collaboration Week, 07/12/2017.

CP violation measurements in b hadrons at LHCb, on behalf of the LHCb Collaboration, at the Meeting of the American Physical Society Division of Particles and Fields, Batavia (Illinois, USA), 03/08/2017.

Measurement of polarisation fractions and CP asymmetries in charmless $B_{(s)}^0$ decays at LHCb, at the XXXVI Reunión Bienal RSEF (Royal Spanish Physics Society) in Santiago de Compostela, 19/07/2017.

W,Z,H+jets at the LHCb experiment, at the Spanish LHC network meeting, Madrid, 09/05/2017.

Charmless two-body b -meson decays at LHCb, on behalf of the LHCb Collaboration, at ICHEP16, Chicago (Illinois, USA), 05/08/2016.

Measurement of f_L and CP asymmetries of the $B^0 \rightarrow \rho^0 K^(892)^0$ decay at the LHCb experiment*, at the VII CPAN days (Segovia, Spain), 01/12/2015.

RESEARCH STAYS

04/07/2016-22/12/2016: CERN. Funded by the program for international stays by Fundación Barrié.

09/05/2016-03/07/2016: CERN. Funded by the High Energy Physics Group of Santiago de Compostela (GAES).

16/10/2015-06/11/2015: CERN. Funded by GAES.

06/07/2015-29/07/2015: CERN. Funded by GAES.

22/06/2014-29/08/2014: CERN. Funded by the Laboratory Summer Student program.

16/07/2013-05/09/2013: Deutsches Elektronen-Synchrotron (DESY), Hamburg.
Funded by the Laboratory Summer Student program.

15/06/2013-15/07/2013: CERN. Funded by GAES.

PARTICIPATION IN CONGRESSES

17-19/11/2018: Implications of LHCb measurements and future prospects, CERN

17-21/09/2018: 10th International Workshop on the CKM Unitarity Triangle, Heidelberg (Germany).

14-18/05/2018: 71st LHCb Analysis and Software week, CERN.

16-18/04/2018: Towards the Ultimate Precision in Flavour Physics, Warwick (United Kingdom).

10-17/03/2018: 53rd Rencontres de Moriond (Electroweak), La Thuile (Italy).

04-08/12/2017: 86th LHCb Collaboration week, CERN.

13-15/11/2017: 2nd Semitauonic decays workshop, LAL, Orsay (France).

08-10/11/2017: Implications of LHCb measurements and future prospects, CERN.

31/07-04/08/2017: 2017 Division of Particles and Fields (DPF2017), Fermi National Accelerator Laboratory, Batavia, Illinois - United States.

17-21/07/2017: XXXVI Reunión Bial de la Real Sociedad Española de Física, Santiago de Compostela.

08-09/05/2017: Spanish LHC network meeting, Madrid (Spain).

12-16/09/2016: 81st external LHCb Collaboration week, Santiago de Compostela.

03-10/08/2016: 38th International Conference on High Energy Physics (ICHEP16), The University of Chicago, Illinois (USA).

09-12/05/2016: 63rd LHCb Analysis and Software week, CERN.

01-03/12/2015: VII CPAN Days, Segovia (Spain).

13-15/07/2015: 60th LHCb Analysis and Software week, CERN.

22-24/06/2015: 26th RD50 Workshop, Santander (Spain).

20-24/04/2015: 59th LHCb Analysis and Software week, CERN.

26/03/2015: III Youth Researchers Meeting, Santiago de Compostela.

29-31/01/2014: Workshop: New Worlds in Particle, Astroparticle and Cosmology, Universidade do Minho, Braga (Portugal).

25-27/11/2013: V CPAN Days, Santiago de Compostela.

04-10/08/2012: XXVII International Conferences of Physics Students, Utrecht (The Netherlands).

11-18/08/2011: XXVI International Conferences of Physics Students, Budapest (Hungary).

TEACHING EXPERIENCE

I am a FPU grant holder, issued by the Spanish government for research and teaching training during the PhD. Therefore, I have participated as teaching assistant in several courses in both the Physics and Chemistry Bachelor degrees at the USC. This included exercise solving classes, laboratory courses, office hours and grading of exercises and tests for a total of 76h in the 2016/2017 and 2017/2018 school terms:

Mathematical methods I (1st year of BScPhys): exercise solving classes, grading.

Mathematical methods III (1st year of BScPhys): exercise solving classes, grading.

Experimental techniques III (3rd year of BScPhys): quantum mechanics laboratory.

Experimental techniques IV (4th year of BScPhys): nuclear physics laboratory.

Nuclear and particle physics (4th year of BScPhys): exercise solving classes, grading.

Physics II (1st year of BScChem): electromagnetism laboratory.

OUTREACH ACTIVITIES

Invited talk: IES Rosalía de Castro de Santiago de Compostela: around 40 students from the last and previous to last year of high school learning. *Sobre o CERN: acelerando e detectando partículas*, 25/09/2017.

Teacher at *Campus de verán da USC*: during three editions of a week-long project to introduce some of the best high school students in Spain in the world of research in Particle Physics, 03-21/07/2017.

Minicampus *Light, electrons and quantum physics*: co-organiser of the event, consisting of an outreach session targeting primary school students, 27/04/2017.

CERN Masterclasses: Main local organiser of the event and speaker for the talk *Analysing data at the CMS experiment of the LHC*, M. Vieites Díaz, Universidade de Santiago de Compostela, 06/03/2017. Helper in previous editions (CMS Masterclasses 2016, 2015 and ATLAS Masterclass 2014).

3rd LHCb Starterkit: helper during several lessons of the event at CERN, 28/11-02/12/2016, CERN.

TEDxCERN 2016: volunteer in the organisation of the event at CERN, assistant to several organisational meetings and hands-on work during the event day, 05/11/2016.

III Youth Researchers Meeting, speaker for the talk *Search for CP violation in the LHCb experiment at CERN*, M. Vieites Díaz, Universidade de Santiago de Compostela, 26/03/2015.

COMPUTING SKILLS

Experience with ROOT, Python, pyCUDA and C++ in high energy physics research projects since 2012. Experience with several tools and python packages for statistics, data analysis and parallel computation: [scikit-learn](#), [hep-ml](#), [pyCUDA](#), [MultiNest](#). Experience in Unix and Windows based systems.

LANGUAGES

Galician: Native Language

Spanish: Native Language

English: Excellent: CEFR B2 level (advanced) issued by the Spanish Official Language School.
Exam iBT TOEFL, February 2014: 102 / 120.

French: Good: CERF A2 level (basic) and completed 1-B1 level, by the Spanish Official Language School.

Portuguese: good reading and oral communication skills.