Section A. PERSONAL INFORMATION

CV date	10/01/2021

First and Family name	Daniel Esperante Pereira		
ID number	52934761P	Age	43
Researcher codes	WoS Researcher ID	A-8093-2016	
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A.1. Current position

Institution	University of Valencia (UV)				
Dpt./Centre	Instituto de Física Corpuscular (IFIC, joint centre CSIC-UV)				
Address	Parc Científic UV, C/Catedrático José Beltrán 2, 46980 Paterna, Spain				
Phone number	+34610341659	E-mail	daniel.esperante@ific.uv.es		
Current position	Researcher (IFIC) and Associate Professor (ETSE-UV)			From:	2017
Keywords	Radio-Frequency (RF) Particle Accelerators, RF structures, High-gradient technology, Beam Instrumentation, Particle Physics Instrumentation, Electronics, Silicon detectors, Data-acquisition systems, Electromagnetics simulations				

A.2. Education

Degree	Institution	Year
PhD in Physics, Electronics and Computing	University of Santiago de Compostela (USC)	2010
Diploma de Estudios Avanzados	USC	2005
Telecommunications Engineering	University of Vigo, Spain	2002

A.3. General quality indicators of scientific production

Scientist with large experience in international collaborations: high-energy particle physics experiments (CERN-LHCb, KEK-BelleII) and Radio-Frequency (RF) accelerators (CERN-LHC, CERN-CLIC, IFIC-RF lab).
More than 15 years of research experience: USC, EPFL Lausanne, IFIC, CERN laboratory.

- Publications. Inspirehep (http://inspirehep.net/author/D.Esperante.Pereira.1): 104 publications, h-index=53. WoS metrics: 143 publications, h-index=38. SCOPUS: 93 publications, h-index=35.
- Research lines: RF particle accelerators; high-gradient acceleration; instrumentation for particle accelerators; hardware and software development for high-energy experiments in harsh environments; high-speed data acquisition systems; silicon detectors development; RF and electronics simulations.
- Higher education accreditation (ANECA): Profesor Ayudante Doctor.
- Teaching experience: School of Engineering (ETSE-UV) and IFIC summer schools.
- Students supervision:
  - Currently 2 PhD students: director of P. Martinez Reviriego and A. Menéndez Márquez.
  - Supervisor of 3 Engineering Final degree project, 7 BSc Thesis, 4 MSc Thesis.
- Committees: advisory board member of the international Joint Universities Accelerator School; thesis jury examiner; reviewer of scientific journals (Nucl. Instr. and Methods in Physics Research Section A, International Journal of Antennas and Propagation, Radiation Detection Technology and Methods).
- International experience: >8 years working at CERN and short stays (>2 weeks) at Uni. Goettingen, Uni. Glasgow, Uni. Bonn, MPI Munich, beam tests at CERN.
- Contracts: Marie-Curie Individual Fellowship, CPAN contract to work at CERN, FPI fellowship

Section B. CV SUMMARY

I am an Applied Scientist (Telecommunications Engineering and PhD in Physics) with a large international experience in R&D in instrumentation for particle physics experiments and Radio-Frequency (RF) accelerators. I have played a leading role in the coordination, design, development and commissioning of scientific instrumentation and complex electronic systems at various particle physics experiments and accelerators facilities. I have been responsible of writing successful proposals and managing projects at IFIC and CERN (European Center for Particle Research).

► *(2019-now)*-**Associate Professor** at the School of Engineering (ETSE-UV).

- *(2019-now)*-**Coordinator** of IFIC High-Gradient RF accelerators laboratory. R&D on accelerating cavities, novel linear accelerators and new hadrontherapy techniques.
- *(2017-2019)*-**Marie Curie Individual Fellowship** at IFIC to develop and commission the so-called IFIC RF-lab. Since then I am the **scientific coordinator** of exploitation of the lab. This is a **unique worldwide facility**, where we test High-Gradient RF S-Band (3 GHz) structures, which will permit constructing compact accelerating cavities, focusing on **hadrontherapy applications**. Project carried out in collaboration with CERN where I did two secondments.
- *(2015-2017)*-**CERN Project Associate at the Beams RF group**. CERN personnel member in the CLIC (Compact Linear International Collider) group. Project: transfer of the normal-conducting high-gradient acceleration technology to **hadrontherapy** applications. It entailed the design and construction of the CLIC X-Band (12 GHz) test facilities at CERN and study potential applications.
- *(2014-2015)*-**CERN Project Associate at the Beams Instrumentation group**. Development of high-speed digital readout and RF electronics for the LHC (the biggest science experiment) fast beam-current intensity detectors.
- *(2011-2014)*-**Researcher** (postdoc) at IFIC in the **DEPFET collaboration** of Belle-II experiment (Japan). R&D for the construction of silicon pixel **DEPFET sensors** for the Belle-II PXD at KEK: development of a system to characterize the detector modules during production stage and R&D on the flip-chip soldering process.
- *(2003-2011)*-**Researcher** and **PhD** in the **LHCb** experiment at CERN. **FPI fellowship** (2003-2007) at USC and a contract with the École Polytechnique Fédérale de Lausanne (EPFL, 2007). I played a major role in the **design, construction and commissioning** of the **Silicon Tracker** detector (silicon micro-strip detector with an area of 12.2 m^2, 270k read-out channels, ~5000 configurable devices and more than 500 high-voltage channels) where I became one of the detector hardware coordinators. I was the **responsible** for the control electronics; the low voltage and high voltage systems; the design of the control software and **coordinator** of the development team; production and testing of the 'detector boxes' on site; irradiation campaigns of electronics and silicon sensors. All this documented in my PhD thesis.

  I also contributed to the upgrade of the LHCb VErtex LOcator: **test-beams** for the silicon sensors and design and development of a high-speed data link.

  From 2008-2011 I was rewarded with one of the 6 **contracts for coordinators/experts** at the LHC experiments from Spanish National Center for Particle Physics (CPAN). I was **coordinator of operation**, hardware and control software at LHCb, during the LHC historical start of operations and data taking.

Section C. MOST RELEVANT MERITS (ordered by typology)

C.1 Publications

More than 100 publications, half of them in medium to large collaborations. My publications of the High Energy Physics experiments are subject to rigorous pre-submission internal review and acceptance procedure. All members of the scientific collaboration are co-authors listed most of the times in strict alphabetic order to reflect all the efforts towards the final physics results (from detector construction to data acquisition and analysis). On the other hand, the publications in the field of particle accelerators are scarce and their impact is usually low since it is a rather niche interest. The reason is that the work developed is usually quite technical, multidisciplinar and the number of journals limited to 2 or 3. It is more common to publish in locally peer-reviewed proceedings of conferences. A selection of my most relevant publications in instrumentation is given here:

1. D. Gonzalez et al., Analytical RF Pulse Heating Analysis for High Gradient Accelerating Structures. IEEE Transactions on Nuclear Science, (2021), DOI: 10.1109/TNS.2021.3049319
2. A. Vnuchenko et al. High-gradient testing of an S-band, normal-conducting low phase velocity accelerating structure, Phys. Rev. Accel. Beams 23, (2020), 084801.
3. D. Esperante et al., Construction and Commissioning of the S-Band High-Gradient RF Laboratory at IFIC, J. Phys. Conf. Ser. 1067, 6 pp., (2018), 082024.
4. T. Argyropoulos et al., Design, fabrication, and high-gradient testing of an X-band, traveling-wave accelerating structure milled from copper halves, Phys. Rev. Accel.Beams, Vol. 21, 12 pp. (2018).
5. D. Esperante, DEPFET active pixel sensors for the vertex detector of the Belle-II experiment, Journal of Instrumentation, Vol. 9, (2014).

6. DEPFET Collaboration, DEPFET active pixel detectors for a future linear e+e− collider, pp. 1457-1465, IEEE Transactions on Nuclear Science 60 (2013).
7. K. Akiba et al., The Timepix Telescope for High Performance Particle Tracking, Nuclear Instruments and Methods in Physics Research Section A, Vol. 723, pp. 47-54 (2013).
8. K. Akiba et al., Charged Particle Tracking with the Timepix ASIC, Nuclear Instruments and Methods in Physics Research Section A, Vol. 661, pp. 31-49 (2012).
9. The LHCb Collaboration, 892/400, The LHCb Detector at the LHC, Journal of Instrumentation, Vol. 3, pp. 1-217 (2008). Cites: 3472

Conference proccedings, peer reviewed publications but non journal:

10. N. Catalán et al., Commissioning of XBox-3: A very high capacity X-band test stand, Conf. Proc. LINAC 2016, Linear Accelerator Conference 2016, pp. 568-571. Cit: 8
11. D. Belohrad, D. Esperante, J. Kral, Upgrade of the LHC bunch by bunch intensity measurement acquisition system, Conf. proc. 2016 International Beam Instrumentation Conf, IBIC 2016.

C.2 Participation in R&D and Innovation projects

- INNEST/2020/123-Agencia Valencia De Innovación (AVI) - DosLINC6+ (2020-2021). Strategic cooperation project with innovative companies, RF and electronics online system for an linear ion injector. PI: B. Gimeno Martínez. 300k€. **Deputy coordinator** of the project.
- H2020-CompactLight-XLS, H2020-INFRADEV-2016-2017. PI: Gerardo D'Auria (Elettra-Trieste). 01/01/2018-31/12/2020. 3M€. Team member and **local coordinator** at IFIC during 2018.
- HGRF-IFIC, H2020-MSCA-IF, GA 750871. Commissioning, first tests and upgrade of a highpower S-Band Radio Frequency system for R+D of high-gradient normal-conducting accelerating cavities in breakdown science and RF conditioning. 05/2017-05/2019. 170k€. **Principal Investigator.**
- PROMETEO/2018/060, Física de precisión a altas energías: el LHC y futuros colisionadores electrón- positrón. PI: J. Fuster Verdu. (IFIC-CSIC). 01/10/2018. 250k€. Team member.
- PGC2018-094856-B-I00, Física en el LHC/ATLAS y en colisionadores e+e. Programa estatal de investigación. PI: J. Fuster Verdú. (IFIC-CSIC), 2019-2021, 160k€. Team member.
- FPA2015-65652-C4-3-R, Contribución a la operación ATLAS y análisis de datos. Investigación y desarrollo (I+D) para futuros aceleradores y estudios de Física, Programa estatal de investigación. PI: J. Fuster Verdú. (IFIC-CSIC). 01/01/2016-31/12/2018. 290k€. Team member.

In addition, I have been member of other nine national/regional projects. Selection: FPA2013-48387-C6-5-P (2013-2015 190k€), FPA2010-21549-C04-04 (2010-2013 298k€), FPA-2008-03076 (2008-2011 731k€), FPA2008-05979-C04-03 (2008-2010 173k€), FPA2005-06441 (2005-2008 732k€).

C.3 Participation in R&D and Innovation contracts

- Contract IFIC-AIMPLAS. Development of gold nano-particle conjugates for applications in hadrontherapy applications. **Co-Principal Investigator**.
- KE3968/BE, IFIC collaboration on CLIC-CERN. J. Fuster. 2018-21. 160k€. **Deputy coordinator**.
- Agreement between the Valencian Innovation Agency and the UV to create an Innovation unit at IFIC, Generalitat Valenciana. PI: IFIC director. 2018-now. 250k€/year. **Sub-project coordinator**.
- Design of an S-Band compact RF spherical pulse compressor. **PI: D. Esperante**. 2017-2018.
- 3 R&D contracts, IFIC-CSIC collaboration on CLIC-CERN: KE2022/TE, KE2023/TE, KE2638/BE. PI: A. Faus. 2012-2018. ~790k€. Project member.

C.4 Grants

- **Marie-Curie Individual Fellowship grant** (2017-2019) for development of the IFIC RF lab.
- **CPAN grant** (2008-2011) for Spanish experts on LHC experiments Spanish Ministry of Science.
- **PhD FPI fellowship.** (2003-2007). 24-months stays grants at CERN grants during the fellowship.

C.5 Academic and commissions of trust:

- PhD Thesis (currently): director of Pablo Martinez Reviriego and Abraham Menéndez Márquez.
- Daily supervisor of 2 PhD Thesis while at Uni. Santiago and IFIC.
- Director of 3 Engineering Final degree project, 7 BSc Thesis, 4 MSc Thesis.
- Summer & semester internships: supervisor of more than 10 BSc and MSc students (work placement as part of the Degree), two students at IFIC summer school.
- Jury member of 3 PhD thesis (P. Rodriguez, Zahra Hazami, M. Boronat).

C.6 Specialized training:

- Joint Universities Accelerator School (**JUAS**), European Scientific Institut. **JUAS 2018**: The science of Particle Accelerators; **JUAS 2015**: Technology & Applications of Particle Accelerators.
- Geant4 course Beginners course (2019); National Instruments High-Throughput LabVIEW FPGA (2018); National Instruments Embedded Control and Monitoring Using LabVIEW (2016); Altera FPGAs seminar (2013); National Instruments Introducción a LabVIEW y LabVIEW Data Acquisition (2013); Cadence University Pspice and Allegro SI training (2011).

C.7 Responsibility tasks and management of scientific activities:

- **Scientific responsible (currently)** of design and commissioning of the IFIC's high-gradient Radio-Frequency laboratory for medical accelerators and other applications. Coordination of the research activities: RF design of high-gradient cavities; studies of the interaction of proton beams with nano-particles for enhanced hadrontherapy treatments; novel ultra-high gradient acceleration techniques.
- **Local coordinator (2018)** of the collaborative CompactLight H2020 project at IFIC.
- Board committee member (2017-2020) of Marie-Curie training network ITN-OMA (ID: 675265).
- **Advisory board member** of the JUAS (Joint Universities Accelerator School) since 2017.
- **Co-organizer** of the International Workshop on Breakdown science and High Gradient acceleration, HG2017, Valencia.
- **Coordinator (2015-2017)** of development of a RF test-stand for accelerator cavities at CERN.
- **Developer (2011-2014)** of the instrumentation for production tests of Belle-II DEPFET modules.
- **Coordinator (2011)** of testbeams of silicon planar sensors for the LHCb VELO upgrade.
- **Expert responsible (2008-2011)** of operations of the Silicon Tracker and SPD detectors of LHCb.
- **Coordinator and designer (2005-2008)** of the Silicon Tracker controls of the LHCb experiment.

C.8 Selection of talks at international conferences and workshops (last 10 years):

I presented results (talks and posters) in many venues, either as speaker or as relevant contributor.

- High-power RF laboratory at IFIC for linear accelerators used in hadronterapy medical applications. AMPERE2019, 17th International Conference on Microwave and High Frequency Heating, Sept. 2019, Valencia. *Keynote speaker*.
- Commissioning of the V-box Laboratory at IFIC, International Workshop on Breakdown Science and High Gradient Accelerator Technology (HG2018), June 2018, Shanghai. *Speaker*.
- Construction and Commissioning of the S-Band High-Gradient RF Laboratory at IFIC, IPAC'18, International Particle Accelerator Conference, May 2018, Vancouver, *Poster author*.
- High-gradient RF activities in Valencia, Linear Collider Workshop 2017, Strasbourg. *Speaker*.
- High-Gradient RF laboratory at IFIC for medical applications, XXXVI Reunión Bienal española de Física 2017, July 2017, Santiago de Compostela. *Speaker*.
- Status of RF Lab in Valencia, International Workshop on Breakdown Science and High Gradient Accelerator Technology (HG2017), June 2017, Valencia. *Speaker*.
- DEPFET active pixel sensors for the vertex detector of the Belle-II experiment, TWEPP 2013-Topical Workshop on Electronics for Particle Physics, Sept. 2013, Perugia. *Poster author*.
- The LHCb Silicon Tracker, first operational results, Instrumentation and Measurement Technology Conference (I2MTC) 2010 IEEE, May 2010, Austin (Texas). *Speaker*.
- Production, commissioning and first data of the LHCb silicon tracker, 7th International Conference on Radiation Effects on Semiconductor Materials, Detectors and Devices (RESMDD 2008), Oct. 2008, Florence, Italy. *Speaker*.

I have also contributed with oral presentations to tens of LHCb and Belle-DEPFET collaboration workshops. I have also presented results of the IFIC RF laboratory at international high-gradient (HG) and CLIC workshops, among others.

C.9 Outreach activities

1. IFIC guide for university and high-school students, ExpoCiencia, presentations at high-schools.
2. Volunteer at 'CERN hackathon' The Port 2016.

C.10 Languages

Spanish and Galician (mother tongue), English (C1), French (B2), Valencian/Catalan (B2).