

Part A. PERSONAL INFORMATION

CV date

20/09/2022

First and Family name	Mónica Fernández Barciela		

(*) *Optional*

(**) *Mandatory*

A.1. Current position

Name of University	Universidad de Vigo		
Department	Signal Theory and Communications		
Address and Country	Escuela Ingeniería Telecomunicación. Maxwell s/n Campus Universitario, 36310 Vigo, SPAIN		
Current position	Associate Professor	From	10/12/1997
Key words	Microwaves, nonlinear circuits, nonlinear modelling, transistors		

A.2. Education

PhD, Licensed, Graduate	University	Year
M.Sc. degree in Physics (electronics specialty)	Universidad de Santiago de Compostela	1989
Ph.D. Degree Telecommunications Engineering	Universidad de Vigo	1996

A.3. General indicators of quality of scientific production

No. "Sexenios" Inv.: **3** Date last one: **2008-2013** No. "Sexenios" Transf: **1** Date: **2000-2016**

No. Graduated PhD students (last ten years): **4**

Total no. of citations: **439**

Average citations per year in last 5 years (2018-2022): $(89)/5=17.8$

No. Journal publications in the first quartil (Q1): **11**

h-index: **11**

(*) Data from Scopus & Web of Science

Part B. CV SUMMARY

Monica Fernandez Barciela received the M.Sc. degree in Physics (electronics) from the Univ. of Santiago de Compostela (USC, Spain) in 1989, and the Ph.D. degree in Telecommunication Engineering from the Univ. of Vigo (UVigo, Spain) in 1996. Her Ph.D work was in millimeter-wave table-based nonlinear FETs models, partly performed at Fraunhofer-Institut (IAF, Germany) through different stay grants. Joined UVigo Communications Technologies Dept. in 1990, first as a FPI granted PhD student, later as Assistant Prof. (1991) and Associate Prof. (1997) at Vigo School of Telecommunication Eng. From July 2010 to Sept. 2014 was vice-director of the Signal Theory and Communications Dept. (UVigo), from Dec. 2017 to Dec. 2019 was president of the IEEE Spanish Joint Chapter MTT-S and AP-S (AP003/MTT017). Since 2010 is executive committee member of atlantTTic Research Center (Uvigo). Mother of four children, from 1991 to 2005 she enjoyed 4 maternity allowances.

Her main research interests are (non)linear characterization and modelling of microwave active devices and circuits, and integrated (Hybrid/MMIC) circuit design for communications applications. IEEE Senior member, Dr. Barciela has been reviewer of national and international journals and conferences and international PhD works (Univ. College Dublin, Cardiff Univ., Aveiro Univ.). ANECA (2016-19) and Spanish Science and Education National Office (MEC) reviewer (2005-8), and ANEP reviewer since 2001. Has co-authored more than 60 papers in international journals, conferences and workshops. Invited to participate in prestigious workshops in topics related to nonlinear vector network analyzer device characterization, nonlinear table-based and behavioral modelling for MW oscillators or power detector design. Led the UVigo participant in TARGET NoE (VI EU Framework Programme), led 7 MEC/MICINN public contracts (6 as sub-Project main researcher, IP, 1 Project IP) and led 12 contracts with industry (local and International) for device characterization and



Hybrid&MMIC design for communications applications. Has ongoing collaborations with Cantabria Univ., Las Palmas de Gran Canaria Univ., Cardiff Univ. and Aveiro Univ. Has co-advised 6 PhD works (5 with European mention, all graded with Honors). Member of the 2018 EuMWeek and 2021 URSI organization committees, and co-president of the URSI2020 and URSI 2022 technical committee. Her main research co-authored contributions are advances in measurement-based time-domain table-based GaAsHEMT/SiGeHBT nonlinear models to predict transistor performance in microwaves and millimetre-waves, taking into account aspects like thermal and low-frequency noise behavior. These models have proven useful in the design of state-of-the-art millimetre-wave frequency multipliers, microwave oscillators and power detectors. Also made contributions in frequency-domain nonlinear behavioral modelling of GaNFETs/SiGeHBTs, applied to free-running and synchronized oscillators design and, in particular, in Admittance behavioral models to predict broadband multi-harmonic load-pull performance in power amplifier design. Also contributed in high efficient power amplifier design and in development of analytical procedures, based on behavioral parameters, to aid in nonlinear circuit design. She aims now toward developing new techniques to make NVNA measurements based behavioral models accurate and practical tools in the design of present and future high power high efficient nonlinear circuits.

Part C. RELEVANT MERITS

C.1. Publications

C.1.1. M. R. Moure, M. Casbon, N. Ladero, **M. Fdez-Barciela** and P. J. Tasker. "Evaluation of admittance domain behavioural model complexity requirements for Power Amplifier design" *IET Microw. Antennas Propag.* Vol.16(12), pp. 780–788, 2022. DOI: 10.1049/mia2.12285

C.1.2. A. Morales-Fernandez, **M. Fdez-Barciela**, F. Isasi-Vicente, et al., "Dual-Band Class-J Power Amplifier at 2.45 and 5.8 GHz for UAVs Communications," *IEEE Access*, vol. 10 pp.: 48673-48680, 2022 DOI: 10.1109/ACCESS.2022.3172475

C.1.3. M. Sajedin; I. Elfergani; J. Rodriguez;...**M. Fdez Barciela**, et al."Ultra-Compact mm-Wave Monolithic IC Doherty Power Amplifier for Mobile Handsets" *Electronics* 2021, 10(17), 2131, Sept. 2021. DOI: 10.3390/ELECTRONICS10172131

C.1.4. M. Sajedin; I.T.E. Elfergani; J. Rodriguez; ... **M. Fdez Barciela** et al., "Multi-Resonant Class-F Power Amplifier Design for 5G Cellular Networks", *RADIOENGINEERING*, VOL. 30, NO. 2, JUNE 2021. DOI: 10.13164/RE.2021.0372

C.1.5. M. Sajedin; I.T.E. Elfergani; J. Rodriguez; R. Abd-Alhameed; **M. Fdez Barciela**, "A Survey on RF and Microwave Doherty Power Amplifier for Mobile Handset Applications", *Electronics*, Vol.8 (6) 717, pp.1-31, 25 June 2019. DOI: 10.3390/electronics8060717

C.1.6. A. Rodríguez-Testera, A. Pelaez-Perez, **M. Fdez Barciela**, P. J. Tasker, "Design of Injection-Locked Oscillator Circuits Using an HBT X-parameter-Based Model", *IET Microw. Antennas Propag.* Vol.9 (4), pp. 380-388, 19 March 2015. DOI: 10.1049/iet-map.2014.0118

C.1.7. **M. Fdez Barciela**, A. Pelaez-Perez, S. Woodington, J. I. Alonso and P.Tasker, "Stretching the Design: Extending Analytical Circuit Design from the Linear to the Nonlinear Domain", *IEEE Microwave Magazine*, Vol.15(6) pp.106-120, 8 Sept 2014. **Invited paper.**

C.1.8. A. R. Testera, O. Mojón, A.S. Boaventura, **M. Fdez Barciela**, N. B. Carvalho, M. Vanden Bossche, G. Pailloncy, "Diode power detector X-parameters model extraction using LSNA-based measurement system", *IET Electronics Let*, 49(3), pp. 196-198, Jan. 2013.

C.1.9. A. M. Pelaez-Perez, S. Woodington, **M. Fdez Barciela**, P. Tasker and J. I. Alonso, "Application of a NVNA-based System and load-independent X-parameters in Analytical Circuit Design assisted by an Experimental Search Algorithm", *IEEE Trans. on Microwave Theory and Techniques*, 61(1), pp. 581–586. Jan. 2013.



C.1.10. A. M. Pelaez-Perez, S. Woodington, **M. Fdez Barciela**, P. J. Tasker and J. I. Alonso, "Large-Signal Oscillator Design Procedure Utilizing Analytical X-parameters Close-Form Expressions", IEEE Trans. on Microw Theory and Tech. 60 (10), pp. 3126-3136, Oct. 2012.

C.2. Research projects

C.2.1 Título: Modelado y diseño de nuevos multiplicadores de frecuencia y amplificadores de potencia para un sistema multi-estrategico de radiocomunicación entre drones y sensores.

PID2020-116569RB-C33. Coordinated with Univ. Cantabria y Univ. Palmas de G C.

Funded by: Ministerio de Ciencia e Innovación. Retos Sociedad.

Participants: Dept. Teoría de la Señal y Comunicaciones, Universidad de Vigo

Exc. time: 01 Sept 2021 - 31 August 2024.

Main Researcher (Uvigo): **M. Fdez Barciela.**

C.2.2 Título: Low Altitude Air/Earth autonomous System for wildland fire Geolocation: Transistor electro-thermal modelling and design methodologies for high efficiency power amplifiers.

TEC2017-88242-C3-2-R. Coordinated with Univ. Cantabria y Univ. Palmas de G C.

Funded by: Ministerio de Ciencia, Innovación y Universidades. EU- FEDER. Retos Sociedad.

Participants: Dept. Teoría de la Señal y Comunicaciones, Universidad de Vigo

Exc. time: 01 Jan 2018 - 31 Dec 2020.

Main Researcher (Uvigo): **M. Fdez Barciela.**

C.2.3 Título New nonlinear transistor behavioral models and design methodologies for dual-band-band power amplifiers for multicopter light weight drones.

TEC2014-60283-C3-3R. Coordinated with Univ. Cantabria y Univ. Palmas de G C.

Funded by: Ministerio de Ciencia e Innovación. EU- FEDER. Prog. Retos Sociedad

Participants: Dept. Teoría de la Señal y Comunicaciones, Universidad de Vigo

Exc. time: 01 Jan 2015 - 31 Dec 2017

Main Researcher (Uvigo): **M. Fdez Barciela.**

C.2.4 Título: New models and simulation tools for complex oscillator configurations: application to practical circuits

TEC2011-29264-C03-03. Coordinated with Univ. Cantabria y Univ. Palmas de G C.

Participants: Dept. Teoría de la Señal y Comunicaciones. Univ. de Vigo

Funded by: Ministerio de Ciencia e Innovación. EU- FEDER

Exec. time: 31 Dec 2011- 31 Dec 2014.

Main Researcher (Uvigo): **M. Fdez Barciela.**

C.2.5 Título: Metodología de diseño optimizado de arrays de osciladores bi-dimensionales para aplicaciones de control de apuntamiento de antenas "phased-array". **TEC2008-06874-C03-**

02. Coordinated with Univ. Cantabria y Univ. Palmas de G C.

Funded by: Ministerio de Ciencia e Innovación. EU- FEDER

Participants: Dept. Teoría de la Señal y Comunicaciones, Univ. de Vigo

Exc. time: 31 Dec 2008-31 Dec 2011

Main Researcher (Uvigo): **M. Fdez Barciela.**

C.2.6 Título: Caracterización multitón de transistores de microondas para xeración e validación precisa de modelos non lineais.

Referencia del Proyecto: INCITE08PXIB322241PR

Funded by: Gobierno Regional de Galicia (Xunta de Galicia)

Participants: Dept. Teoría de la Señal y Comunicaciones, Universidad de Vigo

Exc. time: 02 August 2008- 1 August 2011

Main Researcher: **M. Fdez Barciela**

C.3. Contracts, technological or transfer merits

C.3.1 Título Curso "Fundamentos del diseño de circuitos para transceptores de microondas" (CO-0003-18)



Funded by: TELEVES, S. A.
Exc. time: 28/06/2018 - 10/07/2018
Main Researcher: **M. Fdez Barciela**

No. researcher participants: 2
Participants: Universidad de Vigo

C.3.2 Título contract: "DIFFERENT" (CO-0048-15)

Funded by: TELEVES, S. A.
Exc. time: 01/07/2015 -30/06/2017
Main Researcher: **M. Fdez Barciela**

Participants: Universidad de Vigo
No. researcher participants: 1

C.3.3 Título contract: "Extensión de pruebas de diseño y desarrollo de un prototipo no comercializable de toma inalámbrica de TDT que incluye una etapa amplificadora MMIC" (CO-0030-15)

Funded by: TELEVES, S. A.
Exc. time: 01/05/2015 - 30/06/2015
Main Researcher: **M. Fdez Barciela**

Participants: Universidad de Vigo
No. researcher participants: 1

C.3.4 Título contract: "Pruebas de diseño y desarrollo de un prototipo no comercializable de toma inalámbrica de TDT que incluye una etapa amplificadora MMIC". (CO-003-15).

Funded by: TELEVES, S. A.
Exc. time: 20/01/2015 - 30/04/2015
Main Researcher: **M. Fdez Barciela**

Participants: Universidad de Vigo
No. researcher participants: 1

C.3.5 Título contract: "Caracterización de dispositivos activos e validación de modelos para o deseño dun sub-sistema de microondas". (IN-0445-13)

Funded by: TELEVES, S. A.
Exc. time: 03/10/2013 - 31/12/2013
Main Researcher: **M. Fdez Barciela**

Participants: Universidad de Vigo

C.3.6 Título contract: "Microwave active devices on-wafer characterization". (IN-0036-13)

Funded by: (Under NDA) (Cork) Inc. (Irlanda)

Exc. time: 28/01/2013-18/02/2013

Main Researcher: **M. Fdez Barciela**

Participants: Universidad de Vigo

C.4 Graduated PhD students

C.4.1 Título: "Advancing the Extraction and Robustness of Admittance Behavioural Models for use in CAD Design of Nonlinear Microwave Circuits" (*European PhD Degree*)

Student: M^a Rocío Moure Fernández

University: Vigo

Date: 29 Dec 2019

Grade: Sobresaliente CUM LAUDE.

Co-advisors: **M. Fdez Barciela**, Paul J. Tasker (Univ. Cardiff, UK)

C.4.2 Title: "Experimental characterization and nonlinear modeling of microwave devices by using an LSNA"

Student: Orentino Mojón Ojea

Universidad: Vigo

Date: 2 Dec 2015

Grade: Sobresaliente CUM LAUDE.

Co-advisors: **M. Fdez Barciela**, Paul J. Tasker (Univ. Cardiff, UK)

C.4.3 Title: "X-Parameters Based Analytical Design of Non-Linear Microwave Circuits. Application to Oscillator Design" (*European PhD Degree*)

Student: Ana María Peláez Pérez

University: UPM

Date: 11 July 2012.

Grade: APTO CUM LAUDE

Co-advisors: José Ignacio Alonso Montes (UPM), **M. Fdez Barciela**

C.4.4 Title: "HBT and schottky diode table-based nonlinear models for microwave integrated circuits design" (*European PhD Degree*)

Student: Alejandro Rodríguez Testera

Universidad: Vigo

Date: 29 May 2012

Grade: Sobresaliente CUM LAUDE.

Co-advisors: **M. Fdez Barciela**, Paul J. Tasker (Univ. Cardiff, UK)