

Nicola Vianello

curriculum vitae

Home

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Work

c/o Swiss Plasma
Center
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interests

Plasma physics, Fusion Energy, Turbulence, Non-linear dynamics, Astrophysical plasmas, dynamics in social system

Education and Qualifications

- 1994 **High School, 56 out 60** Liceo Scientifico U.Morin, Venezia
- 1994-1999 **Laurea in Fisica, M.Sc. in Physics magna cum Laude** Università degli Studi di Padova
Thesis title: *Trasporto di particelle ed energia per effetto di turbolenza elettrostatica in plasmi confinati in configurazione Reversed Field Pinch*
Topics: Electrostatic anomalous transport. Sheared Flows. Active modification of boundary flow through edge biasing
- 2000-2002 **Ph.D in Energetics** Università degli Studi di Padova
Thesis title: *Self-organization phenomena and coherent structure generation in magnetized plasmas*
Topics: Electromagnetic turbulence in Reversed Field Pinches and Tokamaks. Anomalous transport. Self Organized Criticality

Further Education

- Oct 2000 **International School of Plasma Physics and Ultrafast Optics** Capri, Italy
- Sept 2001 **5th Carolus Magnus Euro-Summer School on Plasma and Fusion Energy Physics** Badhonnef, Germany
- Jan 2002 **International School on Topics in Nonlinear Dynamics** Venice, Italy
- Jun 2011 **5th International ITER Summer School on MHD and energetic particles** Aix-en-Provence, France

Employment

- 03-10 1999 **Consorzio RFX** Padova, Italy
Research Fellow
- 11-2002
04-2003 **Consorzio RFX** Padova, Italy
Research Fellow
- 05-2003
12-2005 **Consorzio RFX** Padova, Italy
Research Scientist
- 01-2006

Last update: September 13, 2022

07-2009	Consorzio RFX Research Scientist, Permanent staff	Padova, Italy
07-2009 02-2015	Consiglio nazionale delle Ricerche c/o Consorzio RFX Research Scientist, permanent staff, presently on leave	Padova, Italy
03-2015 02-2016	Ecole Polytechnique Federale de Lausanne, Centre de Recherches in Physique des Plasmas Research Scientist	Lausanne, Switzerland
03-2016 Date	Consiglio nazionale delle Ricerche c/o Consorzio RFX Research Scientist, permanent staff, presently on leave	Padova, Italy

Further experiences

03-06 2001	Visiting Scientist under EURATOM-Mobility Staff Movement	Royal Institute of Technology Stockholm, Sweden
05-06 2002	Visiting Scientist under EURATOM-Mobility Staff Movement	Royal Institute of Technology Stockholm, Sweden
03-04 2003	Visiting Scientist under EURATOM-Mobility Staff Movement	Royal Institute of Technology Stockholm, Sweden
04-06 2004	Visiting Scientist under EURATOM-Mobility Staff Movement	Royal Institute of Technology Stockholm, Sweden
10-11 2005	Visiting Scientist under EURATOM-Mobility Staff Movement	Risø National Laboratory, Risø Denmark
02 2008	Visiting Scientist under EURATOM-Mobility Staff Movement	Max Plank Institut für Plasma Physik, Garching Germany
05 2009	Visiting Scientist under EURATOM-Mobility Staff Movement	Max Plank Institut für Plasma Physik, Garching Germany
11 2009	Visiting Scientist under EURATOM-Mobility Staff Movement	CRPP, EPFL, Lausanne Switzerland
03 2011	Visiting Scientist under EURATOM-Mobility Staff Movement	Royal Institute of Technology Stockholm, Sweden
04 2011	Visiting Scientist under EURATOM-Mobility Staff Movement	The National Fusion Laboratory CIEMAT, Madrid Spain
12 2011	Visiting Scientist under EURATOM-Mobility Staff Movement	The National Fusion Laboratory CIEMAT, Madrid Spain
05 2011	Visiting Scientist under EURATOM-Mobility Staff Movement	Max Plank Institut für Plasma Physik, Garching Germany
02-03 2012	Staff Secondment at JET	Culham Centre for Fusion Science, Culham, Oxford UK
07-09 2013	Staff Secondment at JET	Culham Centre for Fusion Science, Culham, Oxford UK
05 2014	Visiting Scientist under EURATOM-Mobility Staff Movement	Max Plank Institut für Plasma Physik, Garching Germany
07 2014	Staff Secondment at JET	Culham Centre for Fusion Science, Culham, Oxford UK

National and International Conferences

09 2000	EU-US Turbulence Task Force Meeting workshop	Varenna, Italy
04 2002	7th Easter Plasma Meeting Oral presentation see reference [1]	Torino, Italy
06 2002	29th EPS Conference on Plasma Physics and Controlled Fusion	Montreux, Switzerland
10 2003	45th APS-Division of Fusion Plasma Physics Conference Poster see	Albuquerque, NM, USA
05 2004	10th IEA/RFP Workshop Oral presentation see [4]	Padova, Italy
06 2004	31th EPS Conference on Plasma Physics Poster see [16, 14]	London, UK
09 2004	EU-US Turbulence Task Force (TTF) workshop Oral presentation see [3]	Varenna, Italy
11 2004	46th APS-Division of Fusion Plasma Physics Conference Oral presentation see [2]	Savannah, GA, USA
07 2005	8th International Workshop on the Interrelationship between Plasma Experiments in Laboratory and Space Oral presentation see [6]	Tromsø, Norway
09 2005	11th IEA/RFP Workshop Oral presentation see [5]	Madison, WI, USA
06 2006	33th EPS Conference on Plasma Physics and Controlled Fusion Poster presentation see [30]	Rome, Italy
10 2006	48th APS-Division of Fusion Plasma Physics Conference Poster presentation see [29]	Philadelphia, PA, USA
04 2007	12th US-EU Transport Taskforce Workshop Oral presentation see [8]	San Diego, CA, USA
09 2007	Momentum transport in jets, disks and laboratory plasmas	Alba, Italy
06 2008	35th EPS Conference on Plasma Physics Oral presentation see [37]	Hersonissos, Greece
06 2008	EFTSOMP2008 - Workshop on Electric Fields, Turbulence and Self-Organisation in Magnetized Plasmas Oral presentation see [11]	Hersonissos, Greece
09 2008	EU-US Turbulence Task Force (TTF) workshop Poster presentation	Copenhagen, Denmark
10 2008	13th IEA/RFP Workshop Oral presentation see [10]	Stockholm, Sweden
03 2009	Workshop on Cross-Scale Coupling in Plasmas Oral presentation see [14]	Cosenza, Italy
06 2009	35th EPS Conference on Plasma Physics and Controlled Fusion Poster presentations see [42, 41]	Sofia, Bulgaria
09 2009	2nd EFDA Transport Topical Group Meeting Oral presentations see [13, 12]	JET, Culham, UK
04 2010	14th IEA/RFP Workshop	Padova, Italy
11 2010	52th APS-Division of Fusion Plasma Physics Conference Oral presentation see [53] and Poster presentation see [54]	Chicago, IL, USA

10 2011	15th IEA/RFP Workshop Oral presentation see [15]	Madison, WI, USA
07 2012	EFTSOMP2012 - Workshop on Electric Fields, Turbulence and Self-Organisation in Magnetized Plasmas Invited lecture, see [16]	Stockholm, Sweden
10 2012	24th IAEA Fusion Energy Conference Poster presentation see [68]	San Diego, CA, USA
03 2013	6th International Workshop on Stochasticity in Fusion Plasmas Oral presentation see [17]	Jülich, Germany
06 2014	41st EPS Conference on Plasma Physics Invited Lecture see [18]	Berlin, Germany

Invited lectures

July 2000	Workshop on Electric Field and Self-Organisation in Magnetized Plasmas Stockholm, Sweden. Invited lecture title <i>The role of 3D fields on edge and SOL turbulence</i>
June 2014	41st EPS Conference on Plasma Physics Berlin, Germany. Invited lecture title <i>Magnetic perturbation as a viable tool for edge turbulence modification</i>

Competition and Habilitation

05 2009	Public selection (Ref. 364/13) held by Consiglio Nazionale delle Ricerche. Advisor Committee: <ul style="list-style-type: none"> • Prof. A. Fasoli, Full Professor, Ecole Polytechnique Federal Lausanne, Switzerland • Dr. V. Antoni, Director Istituto Gas Ionizzati, Consiglio Nazionale delle Ricerche • Dr. D. Farina, Research Scientist, Istituto di Fisica del Plasma, Consiglio Nazionale delle ricerche, Milano The competition included two written exams and one colloquium. The candidate results the winner of the competition with a final mark of 104.5/120
2012	National Scientific Qualification (Abilitazione Scientifica Nazionale). Public evaluation of the competences and scientific achievements to obtain the qualification of <i>Professore Associato</i> (Associate Professor) in Experimental Physics on Material Science (sette concorsuale 02/B1 Fisica Sperimentale della Materia). Grade: Excellent

Skills

IT skills

Operating systems	Linux, Unix, Windows, Mac OSX, Open VMS
Programming	IDL (Interactive Data Language), Python, Bash Scripting, Gnuplot, GIT Version Control
Office	Microsoft Office (Word, Excel, Powerpoint), iWork, L ^A T _E X, web, emails
Design	Adobe InDesign, Adobe Illustrator

Technical skills

- (i) Competences in data analysis and interpretation
- (ii) Competences in image processing
- (iii) Competences in designing of electrostatic and magnetic plasma diagnostics
- (iv) Competences in UHV technology and plasma materials
- (v) Competences in data acquisition through **MDSPLUS** technology

Languages

Mother tongue(s) Italian

Self-assessment According to European Level

English	Understanding		Speaking		Writing	
	Listening	Reading	Listening	Reading		
	C1 Proficient User	C2 Proficient User	C2 Proficient User	C2 Proficient User	C1 Proficient User	

Duties and Responsibilities

- 2007 - 2015** Responsible Scientist for edge manipulators in RFX-mod device. Responsibilities implies the maintenance and improvement of the two manipulators used in RFX-mod for the insertion of edge probes, including maintenance and improvement of the probe heads. Development of new complex probe head, project which has required the coordination between design, mechanical and diagnostic technicians.
- 2009** Task force leader in RFX-mod experiment for task force *Particle, Momentum and energy transport*. The task force was in charge to implement experimental proposals aimed to the comprehension of physical mechanisms which regulate particle momentum and energy transport in RFX-mod. The task force leaders together with the Scientific Coordinators take part to the decision processes concerning the experimental program of the machine, deciding priorities and objectives.
- 2010** Task force leader in RFX-mod experiment for task force *Physics integration for high performance RFP*. The task force aimed to coordinate all the efforts devoted to the comprehension of the physical mechanism behind the appearance of improved confinement regimes in RFX-mod, to establish the physical requirement for a controlled achievement of h-mode confinement regime and to explore all the still open basic physics issues whose knowledge could help to improve plasma performances. As in the previous year the task force leaders take part to the scientific program schedule, coordinating in particular the activities for the high current performance operations.

2011	<p>Coordinator of the EFDA working group <i>3D field effects in edge and SOL and diagnostic development</i> under EFDA Transport Topical Group. This working group has been established to coordinate the effort promoted by different EFDA associations on the following subject:</p> <ol style="list-style-type: none"> 1. Investigation on the effect of non-axisymmetric fields on the filamentary structures (L and H-mode regimes) 2. Investigation into changes in edge transport due to the application of 3D fields 3. Characterization of the edge turbulence in these 3D situations (including effect of ion temperature and 3D fast particle losses) 4. Edge turbulence and transport modelling by incorporating 3D field effects into the codes. 5. Comparison studies between tokamaks, stellarators and RFPs on the above topics. <p>The coordinators promote exchange of results between different association and the definition of common objectives which facilitate the comparison between different devices.</p>
2012	Member of the Program committee of the 17th Joint EU-US Transport Task Force Meeting in combination with the 4th EFDA Transport Topical Group meeting, 3-6 September 2012, Padova, Italy
2013	Scientific Coordinator of back-up experiment B13-19 Investigation of M-Mode on JET campaigns C31-C34. Coordination implies assigning activities to the experimental team, plan the possible experimental campaign to be designed in collaboration with Session leaders, establish scientific objectives and monitoring scientific activities.
2014	Scientific Coordinator of experiment AUG14-2.2.3, SOL filamentary transport at high density , under the MST1 Eurofusion Work-Packages
2015	Scientific Coordinator of experiment TCV15-2.2-3: Filamentary Transport in the SOL under MST1 Eurofusion Work-Package
2015	Scientific Coordinator of experiment TCV15-1.5-1, Mitigation of high Z impurity accumulation through combined central ECRH and tailoring of MHD activity in high performance H-modes under MST1 Eurofusion Work-Package

Pedagogical activity

Teaching

2008-2009	Assistant for the course <i>Fluid and Plasma Physics</i>	University of Padova
	tenured Prof. T. Bolzonella. Tot. 4 h. Seminar on MHD and Fluid turbulence. A summary is presented on the theory and experimental results on turbulence, both in ordinary fluid and in plasmas. A description of the most recent results regarding turbulence and eddy's characterization in thermonuclear relevant plasmas is given. Exercises on fluid turbulence	
2010	Assistant for the course <i>Fluid and Plasma Physics</i>	University of Padova
	tenured Prof. T. Bolzonella. Tot. 6 h. Tangential stresses in ordinary fluid. Seminar on MHD and fluid turbulence (see previous years)	
2011-2012	Assistant to the course <i>Fundamental of Plasma Physics</i>	University of Padova
	Tenured Prof. G. Serianni. Tot 8h. Lectures on plasma waves including Plasma Oscillations, Langmuir waves, Ion acoustic waves, Upper and Lower Hybrid waves, Whistler waves and MHD waves (magneto-acoustic and Alfvén waves)	
2012-2013	Assistant to the course <i>Fundamental of Plasma Physics</i>	University of Padova
	Tenured Prof. G. Serianni. Tot 10h. Lectures on plasma waves including Plasma Oscillations, Langmuir waves, Ion acoustic waves, Upper and Lower Hybrid waves, Whistler waves and MHD waves (magneto-acoustic and Alfvén waves), plasma stability	

- 2013-2014 **Assistant to the course *Fundamental of Plasma Physics*** University of Padova
 Tenured Prof. G. Serianni. Tot 10h. Lectures on plasma waves including Plasma Oscillations, Langmuir waves, Ion acoustic waves, Upper and Lower Hybrid waves, Whistler waves and MHD waves (magneto-acoustic and Alfvén waves), plasma stability
- 2013-2014 **Joint Research Doctorate and European Interuniversity Doctoral Network on Fusion Science and Engineering** University of Padova
 Lecturer for basic Physics course. Tot 4h. Lecture on Transport and Turbulence
- 2014-2015 **Assistant to the course *Fundamental of Plasma Physics*** University of Padova
 Tenured Prof. G. Serianni. Tot 10h. Lectures on plasma waves including Plasma Oscillations, Langmuir waves, Ion acoustic waves, Upper and Lower Hybrid waves, Whistler waves and MHD waves (magneto-acoustic and Alfvén waves), plasma stability

Supervising

- 2007 **Supervisor for Bachelor Thesis in Physics** University of Padova
Candidate: Alessandro Scaggion
Thesis title: *Electrostatic fluctuations characterization in RFX-mod experiment in different experimental condition*
Thesis subject: Characterization of floating potential measurements as obtained from an internal array of sensors in different discharge conditions highlighting dependence on equilibrium and density.
- 2009 **Supervisor for M.Sci Thesis in Physics** University of Padova
Candidate: Alessandro Scaggion
Thesis title: *Filamentary structures in the edge turbulence of fusion device*
Thesis subject: Characterization of turbulence electromagnetic structures in two different devices: RFX-mod Reversed Field Pinch experiment, characterized by the presence of Drift-Alfvén filaments, and ASDEX-Upgrade tokamak, with emphasis on type I ELM's filaments.
- 2011 **Supervisor for Bachelor Thesis in Physics** University of Padova
Candidate: Alberto Mazzi
Thesis title: *Experimental evaluation of toroidal velocity distribution in the edge region of RFX-mod and its impact on high density regimes*
Thesis subject: Experimental determination of the spatio-temporal distribution of the toroidal velocity in RFX-mod and its relationship with edge magnetic topology. The strong link between magnetic islands and plasma flow distribution is addressed.
- 2013 **Supervisor for M.Sci. Thesis in Physics** University of Padova
Candidate: Alberto Mazzi
Thesis title: *Analysis of vorticity coherent structures in magnetically confined plasmas*
Thesis subject: Experimental characterization of vorticity and parallel current associated to the existence of plasma structure at large scales (associated to MHD activity) and small scales (associated to fully developed MHD turbulence)
- 2015 **Supervisor for PhD Thesis in Physics** University of Padova
Candidate: Cristina Rea
Thesis title:
Thesis subject: Experimental characterization of the effect of a 3D magnetic field on electrostatic fluctuations responsible for turbulence induced transport. Comparative analysis between different magnetic configuration)

Summary of research interest

I've been involved in fusion plasma science since my M.Sci. thesis in Physics in 1999.

During these 0 years I've tried to expand as much as possible my personal research skills focusing in particular on collection, analysis, interpretation and modeling of experimental data collected in fusion oriented experiments (Reversed Field Pinches, Tokamaks and Stellarators), with particular emphasis on the comparison with theoretical and numerical results. Main research subjects may be summarized as follow:

- (a) **Electromagnetic turbulence induced transport:** with emphasis on anomalous transport studies induced by different source of turbulence: electrostatic as Drift-induced or interchange induced transport, or electromagnetic including the role of magnetic flutter fluxes in the mechanism of particle and energy losses
- (b) **Statistical analysis of plasma turbulence:** the topic allowed me to get confident with advanced statistical tool (as Wavelet Transforms, Local Intermittency Measurements, Waiting Time distribution) and with dynamical system model as Self-Organized Criticality (SOC) systems, shell-models
- (c) **Blobs and ELM filaments:** non linear coherent structures arising as a non-linear evolution of plasma instabilities have been experimentally investigated. The research includes studies on the generation and evolution of these structures including their parallel dynamics with emphasis on turbulent *blobs* and ELM *filaments*
- (d) **Sheared flow generation** and non linear interaction between turbulence and sheared flows including experimental investigation of the role of Maxwell and Reynolds stress in the momentum generation of edge flow in Reversed Field Pinches
- (e) **Numerical modeling of electromagnetic plasma turbulence** using fluid approach
- (f) **Magnetic topology and its relation with plasma flow**, with emphasis on the effect of non-axisymmetric magnetic field perturbation on kinetic properties of the plasma, as plasma flow, ambipolar electric field and Plasma Wall Interaction
- (g) **Beam plasma interaction** with emphasis on Alfvén instabilities, Energetic Particle Driven instabilities, and turbulent transport of energetic ions

Among the results the following should be highlighted:

- (i) First experimental proof of non applicability of *Self Organized Criticality* paradigm to edge plasma turbulence [8, 3]
- (ii) First experimental evidence of non-linear generation of edge flow in Reversed Field Pinches through Reynolds stress mechanism [29, 28]
- (iii) First experimental measurements of parallel current associated to coherent structures in a fusion relevant plasma [53]
- (iv) First experimental evidence of the existence of a particular class of coherent structure, named *Drift-Kinetic Alfvén vortices*, arising because of the non linear coupling of Drift and Kinetic Alfvén waves in a laboratory plasma [62]. This type of structure has been previously detected in the magnetosphere
- (v) First experimental estimate of parallel current associated to Edge Localized Modes filament [75]
- (vi) First experimental measurements of 2D current distribution associated to plasma blobs [64]
- (vii) Experimental evidence of transition towards helical states in high current Reversed Field Pinch operation [45]

In all my carrier I've always tried to conjugate a strong experimental insight on the data collection, participating in all the experimental activities mandatory in order to obtain useful experimental results, and a rigorous theoretical approach in the data analysis and interpretation, using theories and numerical tools as a framework to understand real plasma signals. This approach helped me to build a bridge between theories and experiments, a necessary effort in order to understand complex plasma dynamics.

Active collaborations

Institute	Contact person	Subject
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Department of Physics, DTU Technical University of Denmark	V. Naulin and J. Rasmussen	Edge turbulence in tokamaks, including ELM filaments. Fluid turbulence codes
CRPP Lausanne CIEMAT, Spain	I. Furno C. Hidalgo	Blobs in Simple Toroidal Torus Edge filament structures in Stellarators
KTH Stockholm	H. Bergsaker and L. Frassinetti	Characterization of the edge region of RFP experiment Extrap-T2R
MIT, Boston	J. Terry	Edge turbulence in Alcator C-Mod
IPP, Garching	H. W. Müller and D. Carralero	Electromagnetic turbulence at the edge of ASDEX-Upgrade, ELMs
JET, Culham	E. Solano	Investigation of M-Mode on JET

Other

I'm regular referee for Physical Review Letters, Plasma Physics and Controlled Fusion, Nuclear Fusion, New Journal of Physics

Publications

I have authored a total number of 143 Articles in peer reviewed journal, 92 conference proceedings and personally presented 18 oral contribution.

h-index factor: 21 according to ISI Web of Knowledge (last update September 13, 2022)

Article in peer-review journal

- [1] V. Antoni, R. Cavazzana, L. Fattorini, E. Martines, G. Serianni, M. Spolaore, L. Tramontin, and N. Vianello "Effects of pulsed poloidal current drive on the edge region of a reversed field pinch plasma", *Plasma Physics and Controlled Fusion* **42**, 893–904, (2000).
- [2] V. Antoni, E. Martines, D. Desideri, L. Fattorini, G. Serianni, M. Spolaore, L. Tramontin, and N. Vianello "Electrostatic transport reduction induced by flow shear modification in a reversed field pinch plasma", *Plasma Physics and Controlled Fusion* **42**, 83–90, (2000).
- [3] V. Antoni, V. Carbone, R. Cavazzana, G. Regnoli, N. Vianello, E. Spada, L. Fattorini, E. Martines, G. Serianni, M. Spolaore, L. Tramontin, and P. Veltri "Transport processes in reversed-field-pinch plasmas: Inconsistency with the self-organized-criticality paradigm", *Physical Review Letters* **87**, 045001, (2001).
- [4] V. Antoni, V. Carbone, E. Martines, G. Regnoli, G. Serianni, N. Vianello, and P. Veltri "Electrostatic turbulence intermittency and MHD relaxation phenomena in a RFP plasma", *Europhys Lett* **54**, 51–57, (2001).
- [5] V. Antoni, M. Valisa, L. Apolloni, M. Bagatin, W. Baker, O. Barana, R. Bartiromo, P. Bettini, A. Boboc, T. Bolzonella, A. Buffa, A. Canton, S. Cappello, L. Carraro, R. Cavazzana, G. Chitarin, S. Costa, F. D'Angelo, S. D. Bello, A. D. Lorenzi, D. Desideri, D. F. Escande, L. Fattorini, P. Fiorentin, P. Franz, E. Gaio, L. Garzotti, L. Giudicotti, F. Gnesotto, L. Grando, S. Guo, P. Innocente, A. Intravaia, R. Lorenzini, A. Luchetta, G. Malesani, G. Manduchi, G. Marchiori, L. Marrelli, P. Martin, E. Martines, S. Martini, A. Maschio, A. Masiello, F. Milani, M. Moresco, A. Murari, P. Nielsen, M. O'Gorman, S. Ortolani, R. Paccagnella, R. Pasqualotto, B. Pegourie, S. Peruzzo, R. Piovani, N. Pomaro, A. Ponno, G. Preti, M. Puiatti, G. Rostagni, F. Sattin, P. Scarin, G. Serianni, P. Sonato, E. Spada, G. Spizzo, M. Spolaore, C. Taliercio, G. Telesca, D. Terranova, V. Toigo, L. Tramontin, N. Vianello, M. Viterbo, L. Zabeo, P. Zaccaria, P. Zanca, B. Zaniol, L. Zanutto, E. Zilli, and G. Zollino "Transport mechanisms and enhanced confinement studies in RFX", *Nucl. Fusion* **41**, 431–436, (2001).

- [6] E. Martines, M. Spolaore, V. Antoni, G. Regnoli, N. Vianello, R. Cavazzana, G. Serianni, and L. Tramontin “*E x B velocity shear and intermittent structures in RFX*”, *Czechoslovak Journal Of Physics* **51**, 983–993, (2001).
- [7] G. Serianni, V. Antoni, H. Bergs aker, P. R. Brunsell, J. Drake, M. Spolaore, H. Satherblom, and N. Vianello “*Electrostatic fluxes and plasma rotation in the edge region of EXTRAP-T2R*”, *Czechoslovak Journal Of Physics* **51**, 1119–1127, (2001).
- [8] E. Spada, V. Carbone, R. Cavazzana, L. Fattorini, G. Regnoli, N. Vianello, V. Antoni, E. Martines, G. Serianni, M. Spolaore, and L. Tramontin “*Search of self-organized criticality processes in magnetically confined plasmas: Hints from the reversed field pinch configuration*”, *Physical Review Letters* **86**, 3032–3035, (2001).
- [9] M. Spolaore, V. Antoni, M. Bagatin, D. Desideri, L. Fattorini, E. Martines, G. Serianni, L. Tramontin, and N. Vianello “*Study of edge plasma properties comparing operation in hydrogen and helium in RFX*”, *Journal of Nuclear Materials* **290-293**, 729–732, (2001).
- [10] V. Carbone, R. Cavazzana, V. Antoni, L. Sorriso-Valvo, E. Spada, G. Regnoli, P. Giuliani, N. Vianello, F. Lepreti, R. Bruno, E. Martines, and P. Veltri “*To what extent can dynamical models describe statistical features of turbulent flows?*”, *Europhys Lett* **58**, 349–355, (2002).
- [11] P. Martin, S. Martini, V. Antoni, L. Apolloni, M. Bagatin, W. Baker, O. Barana, R. Bartiromo, P. Bettini, A. Boboc, T. Bolzonella, A. Buffa, A. Canton, S. Cappello, L. Carraro, R. Cavazzana, G. Chitarin, S. Costa, F. D’Angelo, S. D. Bello, A. D. Lorenzi, D. Desideri, D. F. Escande, L. Fattorini, P. Fiorentin, P. Franz, E. Gaio, L. Garzotti, L. Giudicotti, F. Gnesotto, L. Grando, S. Guo, P. Innocente, A. Intravaia, R. Lorenzini, A. Luchetta, G. Malesani, G. Manduchi, G. Marchiori, L. Marrelli, E. Martines, A. Maschio, A. Masiello, F. Milani, M. Moresco, A. Murari, P. Nielsen, M. O’Gorman, S. Ortolani, R. Paccagnella, R. Pasqualotto, B. Pegourie, S. Peruzzo, R. Piovan, N. Pomaro, A. Ponno, G. Preti, M. Puiatti, G. Rostagni, F. Sattin, P. Scarin, G. Serianni, P. Sonato, E. Spada, G. Spizzo, M. Spolaore, C. Taliercio, G. Telesca, D. Terranova, V. Toigo, L. Tramontin, M. Valisa, N. Vianello, M. Viterbo, L. Zabeo, P. Zaccaria, P. Zanca, B. Zaniol, L. Zanutto, E. Zilli, and G. Zollino “*New insights into MHD dynamics of magnetically confined plasmas from experiments in RFX*”, *Nucl. Fusion* **42**, 247–257, (2002).
- [12] E. Martines, V. Antoni, R. Cavazzana, G. Regnoli, G. Serianni, M. Spolaore, N. Vianello, M. Hron, and J. Stockel “*Coherent structures in the plasma edge turbulence of the RFX and CASTOR experiments*”, *Czechoslovak Journal Of Physics* **52**, 13–24, (2002).
- [13] M. Spolaore, V. Antoni, R. Cavazzana, G. Regnoli, G. Serianni, E. Spada, N. Vianello, H. Bergs aker, and J. Drake “*Effects of ExB velocity shear on electrostatic structures*”, *Phys. Plasmas* **9**, 4110–4113, (2002).
- [14] L. Tramontin, L. Garzotti, V. Antoni, L. Carraro, D. Desideri, P. Innocente, E. Martines, G. Serianni, M. Spolaore, and N. Vianello “*Particle balance during edge biasing experiments in the reversed field pinch RFX*”, *Plasma Physics and Controlled Fusion* **44**, 195–204, (2002).
- [15] N. Vianello, M. Spolaore, G. Serianni, H. Bergs aker, V. Antoni, and J. Drake “*Properties of the edge plasma in the rebuilt Extrap-T2R reversed field pinch experiment*”, *Plasma Physics and Controlled Fusion* **44**, 2513–2523, (2002).
- [16] V. Antoni, M. Bagatin, G. Serianni, N. Vianello, M. Zuin, F. Paganucci, P. Rossetti, and M. Andrenucci “*Plasma Fluctuations in an Applied Field MPD Thruster*”, *AIP Conf. Proc.* **669**, 302–305, (2003).
- [17] V. Antoni, H. Bergs aker, G. Serianni, M. Spolaore, N. Vianello, R. Cavazzana, G. Regnoli, E. Spada, E. Martines, M. Bagatin, and J. Drake “*Anomalous particle transport and flow shear in the edge region of RFP’s*”, *Journal of Nuclear Materials* **313-316 IS -**, 972–975, (2003).
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Declaration

I hereby declare that the above information are true and correct to the best of my knowledge and belief and in the event of any information being found false or incorrect, my candidature will be liable to be canceled.

Padova, September 13, 2022

A handwritten signature in black ink, appearing to read 'Nicola Vianello', with a long, sweeping horizontal stroke extending to the left.

(Nicola Vianello)