CURRICULUM SCIENTIFICO E DIDATTICO
PAOLO MINZIONI

RESEARCHER UNIQUE IDENTIFIERS:

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RESEARCHERID: D-3058-2012

EDUCATION

2002 – 2006 **University of Pavia** **Pavia, Italy**
Ph.D. in Electronic, Electric and Computer Science Engineering, January 2006
Thesis title: "*Devices for Next Generation Optical Networks*" Supervisor: Prof. V. Degiorgio

1996 – 2002 **University of Pavia** **Pavia, Italy**
Laurea in Ingegneria Elettronica (110 cum Laude /110), March 2002
Thesis title: "*Non-Linear Effects Reduction in a Fiber Telecommunication System by Optical Phase Conjugation*"
- Best laureate of the year at the Engineering School of the University of Pavia

WORK EXPERIENCE

2008 – present **University of Pavia** **Pavia** **Italy**
Assistant Professor

- Head of Integrated Photonics Lab 1,
- Principal Investigator and responsible for the University of Pavia unit in EU-Project NISTAS
- Co-investigator of EU-Project FABULOUS
- Responsible for different research activities in collaboration with companies and research centers.

Oct – Dec. 2019 **Harvard University** **Cambridge, MA** **USA**
Visiting Researcher at Wellman Center for Photomedicine,

- The research activity will mainly deal with the development of new fiber types with optimized characteristics for biological applications. Tuning the chemical properties of the polymers it is in fact possible to control their transparency, stretchability, flexibility, bio compatibility and degradability, thus allowing the realization of bio-resorbable optical components.

Oct – Dec. 2016 **Tufts University** **Medford, MA** **USA**
Visiting Reseracher at SilkLab

- Research activity in photonic applications of regenerated silk fibroin. The activity included different aspects: defining new research lines, supervising Ph.D. students, performing theoretical investigations, designing implantable photonic elements and carrying out the experimental activities.
- Started new collaborations for joint research projects.

2006 – 2008 **University of Pavia** **Pavia** **Italy**
Post-doc Researcher

- Received 3 annual research grants from University of Pavia to study optical properties and nonlinear applications of innovative materials.
- Conducted first studies regarding development of fiber-based optical tweezers yielding 2 patent applications about particle trapping and manipulation.

2001 – 2005 **Pirelli Labs** **Milan, Italy**
Advisor

- Advisor for long-distance optical transmission system design, resulting in 4 patent applications.
- Advisor for device characterization project resulting mainly in internal feedbacks (confidential)
- Advisor for the definition of device specifications for products development, and for market analysis
- Advisor for the analysis of device-impact on transmission systems (confidential reports)

INSTITUTIONAL RESPONSIBILITIES AT UNIVERSITY OF PAVIA

2016 – present Member of "Commissione Paritetica Docenti-Studenti" at the Engineering School

2017 – present Member of "Collegio Docenti"; Ph.D. School in Electronics, Computer Science and Electrical Engineering

2015 - 2018 Member of "Consiglio Direttivo di Facoltà" of the Engineering School

2015 - 2018 Member of "Giunta di Dipartimento" Electrical, Computer, and Biomedical Eng. Dept.

COMMISSIONS OF TRUST

2018 - present Member of the Editorial Board of Optics Express (Optical Society of America)

2016 - present Member of the Editorial Board of Scientific Reports (Nature Research)

2016 - present Member of the International Traveling Lecturer Program of the Optical Society of America

2017 - 2018 Member of the Editorial Board of Micromachines (MDPI)

2016 - 2018 Member of the Editorial Board of Applied Sciences (MDPI)

2016 - 2018 Member of the Advisory Board of Preprints (MDPI)

Projects and Papers Reviewer for the Italian Ministry of University and Research (MIUR)

Projects Reviewer for the French National Research Agency (ANR)

Projects Reviewer for the German Research Foundation (*Deutsche Forschungsgemeinschaft*)

Reviewer for different journals

External member of the Ph.D. final-exam commission at University of Padova, Italy (four times)

External member of the Ph.D. final-exam commission at Aston University, UK (twice)

Ph.D. Thesis Reviewer for Scuola Superiore Sant'Anna, Pisa, Italy (once)

ORGANIZATION OF SCIENTIFIC MEETINGS AND EVENTS

2019 - present Member of the Technical Committee for the *Italian Conference on Optics and Photonics*

2017 - present Member of the Technical Committee for the Italian Conference *"Fotonica"*

2010 - present Member of the *"BergamoScienza"* selection committee since 2010

2010 Organizer of the Italian *Laserfest* outreaching event

2003 Co-organizer of Workshop *"Recent trends in nonlinear optics & ultra-short pulse generation"*

NATIONAL SCIENTIFIC HABILITATION (ASN)

12/04/2017 Abilitazione Scientifica Nazionale (scadenza 12/04/2023) a ricoprire il ruolo di Professore Ordinario (I fascia) e Professore Associato (II fascia) per il settore 02/B1 (Fisica sperimentale della materia)

SHORT DESCRIPTION OF RESEARCH ACTIVITIES

My activity has always been characterized by a strong collaboration with different universities and companies, both in Italy and in other countries. The performed research activity has been focussed on the following topics:

- OPTICAL PHASE CONJUGATION: OPTIMIZED $X^{(2)}$ MATERIALS, DEVICE CONFIGURATION AND COMPENSATION OF FIBER NONLINEAR EFFECTS

The activity carried out in this field has covered many different aspects, including the study of the material physical and optical properties, integrated waveguides design, device configuration, and system-level performance optimization. The different research loines have been carried out in collaborations with different research centers and universities, including: *Pirelli Labs* (transmission-systems group, Milano, Italy), *Stanford University* (Stanford, CA, USA), *Università degli Studi di Padova* (Padova, Italy), *National Academy of Sciences of Armenia* (Ashtarak, Armenia), *Paderborn University* (Paderborn, Germany).
It is well known that Lithium Niobate (LiNbO3, shortly indicated as LN in the following) has very high nonlinear optical coefficient, allowing to realize high efficiency components. Nevertheless, the use of LN crystals for nonlinear optics applications is strongly limited by the photorefractive effect, which causes a distortion of the refractive indices of the material, potentially yielding also a complete distortion of the propagating optical beam, thus making the crystal unusable. The performed research has demonstrated that a relevant reduction of LN photorefractivity can be obtained by doping the crystal with a small quantity of tetravalent ions, like Hafnium (Hf) or Zirconium (Zr) instead of the commonly used divalent Magnesium (Mg). In particular the choice of Zirconium seems particularly promising as it was demonstrated that its segregation coefficient is very close to one, its ionic radius well matches with the LN lattice. Additionally, also thanks to the low amount of Zr-ions required to suppress photorefractivity, it has also been possible to demonstrate the realization of periodically poled Zr-doped LN, and of integrated waveguides by Annealed Proton-Exchange as in pure congruent LN crystals.
Thanks to a properly designed device configuration it was also demonstrated that LN-based integrated components are perfectly suited to realize optical phase conjugators, which can be successfully inserted in fiber communication systems to allow the simultaneous compensation of fiber dispersive and nonlinear effects. In particular the activity demonstrated that in order to achieve efficient compensation of the nonlinear effects a fundamental role was played by the distribution of high-power regions with respect to the signal accumulated dispersion. That observation was the key point allowing a unifying vision of all the nonlinearity-compensation techniques previously reported in the literature for high bit-rate transmission systems, including both those based on optical phase conjugation and those focusing on optimal dispersion-mapping. As a further extension, the nonlinearity-compensation efficiency of the proposed system was demonstrated considering phase-modulated optical transmission systems, where Gordon-Mollenauer effect (caused by the nonlinear interplay between the signal and the amplified spontaneous emission due to the in-line amplifiers) is a main cause of signal distortion.

- SILICON PHOTONICS: DESIGN AND DEMONSTRATION OF DIFFERENT BUILDING BLOCKS (BRAGG REFLECTORS, MICRORING FILTERS, MACH-ZEHNDER SWITCHES, GRATING COUPLERS)

Over the last 20 years, silicon photonics has revolutionized the field of integrated optics, providing a novel and powerful platform to build mass-producible optical circuits. One of the most attractive aspects of silicon photonics is its ability to provide small optical components, and extremely compact photonic devices thanks to the use of microfabrication technologies previously developed by the microelectronics industry. As a consequence, Silicon is nowadays considered as the most interesting substrate for the development of photonic integrated circuits (often indicated as PICs) suitable for mass production. Integrated high-performance optical devices, realized using a Silicon-based platform (such as those exploiting SiO_2, SiON, Si, Si_3N_4, etc…), were designed and characterized, by using innovative approaches specifically created for the desired component. A part of this activity was carried out in collaboration with the “integrated devices” team of *Pirelli Labs* (Milano, Italy), while the majority of the activity was carried out in the frame of the European FP7 project Fabulous, which aimed at the realization of low-cost optical network units for high bit-rate bidirectional passive networks.

In case of integrated Bragg reflectors a new design strategy allowing to separately tailor the amplitude and phase of a 1D photonic-crystal's transfer function was demonstrated. Thanks to this possibility optical filters with an almost-ideal transfer function can be designed, and exploited to filter optical signals with very high bit-rate.
A large part of the activity in this field was devoted to the design and characterization of integrated grating couplers. The relevance of these components can be immediately understood considering that Si-based PICs have a waveguide cross section which is almost 3 orders of magnitude smaller than optical fibers, thus requiring specific solutions for fiber-to-chip coupling. Fiber-to-silicon photonic chip interfaces can be broadly divided into two principle categories: in-plane and out-of-plane couplers. Devices falling into the first category typically offer relatively high coupling efficiency, large bandwidth, and low polarization dependence but they also require relatively complex fabrication and assembly procedures, which are not directly compatible with wafer-scale testing. Conversely, out-of-plane coupling devices offer a lower efficiency, narrower bandwidth, and are usually polarization dependent, but their compatibility with high-volume fabrication and packaging processes together with the fact that they enable on-wafer access to any part of the optical circuit makes them a common choice for both research purposes and industrial purposes. The activity carried out in this field has been mainly devoted to study a new grating-design strategy, aiming at the identification of structures easily compatible with standard CMOS processes, while allowing to obtain coupling-efficiency values. As a final result of this activity, we were able to highlight the mistakes present in the commonly used approaches for grating design, and to experimentally demonstrate a grating-coupler with a coupling efficiency better than -1 dB. Interestingly, a so high coupling efficiency was obtained just with a proper choice of the structure parameters, but without exploiting complex configurations, as those requiring double-etching, double layer gratings, or the realization of mirror-like surfaces on the wafer’s back.
In case of microring filters, which are a fundamental building block of PICs, two of the main issues limiting their exploitation in many commercial devices are the presence or relatively high insertion losses (IL), and the need to use high-resolution fabrication techniques (e.g. E-beam lithography) which are not compatible with standard fabrication process for large volume components. Thanks to a proper design of both the waveguide cross section and the fiber-to-ring coupling region, and by properly taking into account the fabrication tolerances typical of UV-lithography, it was possible to demonstrate for the first time integrated microring-based filters with an insertion loss < 1 dB (experimental data IL = 0.8 dB, corresponding to a power loss < 20%) which could be realized by using standard technologies.
Finally, another important result was obtained by designing integrated Mach-Zehnder interferometers allowing all-optical signal switching. In order to achieve such a result, an on-chip interferometer exploiting two different materials (Silicon and SU-8) for the two arms was used, thus allowing to create an optically-controlled phase shift between the beams propagating along the structure. Interestingly thanks to a careful design, relatively low-power was required (10dB lower than usually reported values), and response times lower than 2ps were experimentally demonstrated.

- MICRO-OPTOFLUIDIC SYSTEMS: OPTICAL TRAPPING AND MANIPULATION, INTEGRATED OPTOFLUIDIC SYSTEMS, COMBINED OPTICAL AND ACOUSTIC ACTUATORS

The research activity carried out in this field included many different aspects, which can be roughly grouped in 3 main topics (briefly described in the following): fiber-based optical-tweezers, the use of counter-propagating optical beam in a microfluidic system for optical trapping and manipulation, the study of acoustic actuation both as a support-tool for optically-realized analysis and as a cell-selection system.
The activity dealing with fiber-based optical tweezers was funded by a grant from *CNISM* (which is an acronym for “*consorzio nazionale interuniversitario per le scienze fisiche della materia*”) and were carried out largely at the University of Pavia, but with some key collaboration with *Università della Magna Graecia* (in Catanzaro, Italy) and with *Istituto Italiano di Tecnologia* (in Genova, Italy), to take advantage of the fabrication facilities and competences available at the two centers. Optical tweezers attracted an enormous interest for their potential applications during the last decades. Generally such systems exploit high-NA objectives and a proper system of lenses together with spatial light modulators to allow trapping and moving the desired sample. In 2007 we demonstrated the first fiber-based optical tweezers with 3D-trapping capabilities, which allowed trapping and moving the samples without high-NA objectives and with no SLM. Such a result was achieved by the proper modification of the terminal part of a custom-made fiber bundle. Thanks to a proper shaping of the bundle end-surface, and by exploiting reflection (instead of refraction) at the bundle-external medium interface, we achieved an effect equivalent to high-NA beam focussing. We also demonstrated the possibility to use such a structure for fluorescence excitation/collection and for micro-Raman experiments on single trapped cells.

Thanks to the intrinsic size-matching between microfluidic circuits and optical beam the integration of optical actuators in a lab-on-chip system is pretty natural. In particular we focused our attention on the possibilities offered by a counter-propagating beams geometry and we demonstrated the first fully-integrated micro-fluidic chip including both a square-section micro-channel and the optical waveguides required to trap, stretch and sort single-cells. Using such a structure, offering efficient trapping and high reliability of the obtained results, we were able to analyse the effect of temperature and drug treatments on different cells. We also demonstrated the possibility to sort cells with the same size distribution on the basis of their mechanical properties and without requiring any labelling. Such a result is extremely important, because it is well known that the mechanical properties of cells can be used as an indicator of the cell status and type. These results have been achieved thanks to an intense collaboration with *Istituto di Genetica Molecolare* (in Pavia) and *Istituto di Fotonica e Nanotecnologie* (in Milano) of the *Consiglio Nazionale delle Ricerche*, and the work has been partially funded by CARIPLO foundation in the frame of a research project aiming
Recently we investigated, in collaboration with *Università degli Studi di Milano* and *Istituto di Fotonica e Nanotecnologie* (both in Milano, Italy) the use of a similar structure in order to realize active micro-rheology measurements. Micro-rheology is a field currently in great expansion, as there is an increasing interest to measure the viscoelastic properties of materials which are available in very small volumes. While optical tweezers constitute a reference technique for passive microrheology measurements, where the Brownian motion of the trapped particle is used to evaluate the material properties, they are not well suited for active microrheology measurements, where a controlled force should be applied on the tracers dispersed in the material. Conversely, the use of a counter-propagating geometry is particularly well suited to this aim, as it allows applying large optical forces (hundreds of pN) and to use beads of different sizes as tracers. In particular we used such a system to investigate the properties of transient networks formed by 3-arms DNA nanostars.
Another activity carried out in the field of optofluidic and microfluidic devices, in collaboration with *Technical University of Denmark* (Copenhagen, Denmark) and with *Southwest University* (in Chongqing, China), has been that dedicated to the study of system using acoustophoretic actuation: by using both standing and traveling waves into a microfluidic system it is in fact possible to control the movement of a dispersed sample (e.g. beads, cells, etc…). The activity in this field has been first aimed at realizing an optical stretcher exploiting acoustic forces as a pre-focusing technique, and then we investigated the optimal design of a microfluidic system for cell sorting. Thanks to a careful theoretical analysis and to extensive numerical simulations we demonstrated the relevance of parameters generally overlooked in the past (as the cross-section of the sample inlet and its position) and we were able to highlight the different impact of system-related and sample-related parameters. As a consequence we were finally able to derive some general design rules which could be fruitfully used to design new chips for sample separation and sorting, or to isolate rare cells, as in the case of circulating tumour's cells (CTCs).

- BIOPHOTONICS & BIOPOLYMERS: NATURAL, BIODEGRADABLE AND BIORESORBABLE MATERIALS FOR PHOTONIC COMPONENTS AND DEVICES

This part of the activity deals with the interaction of light with biopolymers and with biological material, and it is divided into three main branches: one industrial-development project (EU-funded project *NISTAS*) and two academic research lines (photo-dynamic-therapy and photo-bio-modulation on one side and, bio-polymer based optical structures).
The activity carried out in the frame of the NISTAS project (*Non-invasive screening of the status of the vascular system*, 7th Framework Program for Small Medium Enterprises) was mainly divided in two phases. The first one aimed at the identification of the system parameters required to realize a contactless photonic system suitable to measure the pulse-wave velocity (PWV) along the carotid artery (by using a laser-triangulation approach), while the second one aimed at the development of a suitable signal-analysis technique allowing to reliably calculate the PWV value starting from the recorded displacement curves. The results of this activity, only partially reported at a few conferences, were used by the SMEs involved in the NISTAS project (*Eclexys S.A.G.L.* in Switzerland, *Julight S.R.L.* in Italy and *EPI-LIGHT Ltd.* in Ireland) to create a working prototype of the final device, and to carry out clinical trials aiming at the comparison between the new laser-based measurement approach and the "golden standard" method currently identified in the use of *ecocolordoppler* imaging. Interestingly the developed research highlighted that some of the system requirements were not as strict as initially supposed, and even the comparison between different signal-analysis approaches caused a significant change with respect to the algorithms proposed in the project proposal.

The activity dealing with photo-dynamic-therapy was carried out in collaboration with different groups, from both chemistry and biology departments. In this activity my main research role as been to setup the optical equipment on one side and to devise a suitable research plan on the other. In particular, by analyzing the scientific literature dealing with this topic, it is often possible to notice that the impact of many physical effects is generally neglected, yielding to a low reproducibility of results. For this reason I was often involved in the overall project planning, allowing me to get an interesting overview of many different aspects, ranging from the production of nanorods and nanostars to the analysis of biological cell cultures.

The activity regarding the development of biopolymer based structures was initially carried out in collaboration with SilkLab of *Tufts University* (Medford, Boston Area, MA, USA). By studying the possibilities offered by silk fibroin we demonstrated the possibility to realize multi-layer inverse opals, with controlled period, and also to introduce 1D defects inside the photonic band gap. The interesting property of these particular structures, which can be easily used as sensors by monitoring the wavelength shift of the defect, is that they were realized by fully bio-compatible materials, allowing also for the realization of bio-resorbable and bio-degradable sensors for patients of environmental monitoring purposes. Due to the difficulties inherent with silk fibroin preparation, the activity is planned to continue with the analysis (which I'll carry out at *Harvard University* and *Massachusetts General Hospital*, in Cambridge and Boston respectively, MA USA) of possibilities offered by different bio-polymers.

TEACHING ACTIVITIES

- **2017/18 – present** Professor of “Biophotonics B” at Università degli Studi di Pavia
- **2015/16 – present** Professor of “Physics 1” at Università degli Studi di Pavia
- **2015** Professor of the Short Course “Biophotonics: principles and applications” at Hebei University of Technology, Tianjin, China for the Materials Physics class
- **2014/15** Professor of “Microfluidics” course at Istituto Universitario di Studi Superiori in Pavia
- **2010/11 – 2014/15** Professor of “Physics 2” at Università degli Studi di Pavia
- **2007/08 – 2009/10** Professor of “Optical Communications Systems” course for the ESAS Master in Materials Science.
- Tutor of 4 Ph.D. students
- Supervisor of 30+ BS & MS in Electronics and Biomedical Engineering.

Summary of the course given at University of Pavia and evaluations given by students regarding the teaching quality (questions D6, D7, D8)

Academic Year	**Course**	**CFU**	**# Students**	**D6**	**D7**	**D8**
2018/19	Physics 1	9	303	N.A.	N.A.	N.A.
2018/19	Biophotonics B	3	4	N.A.	N.A.	N.A.
2017/18	Physics 1	9	237	8.24	8.10	9.04
2017/18	Biophotonics B	3	3	10	10	10
2016/17	Physics 1	9	169	7.83	7.58	8.85
2016/17	Physics 1	9	203	7.39	7.19	8.64
2015/16	Physics 1	9	186	8.41	8.70	8.33
2014/15	Physics 2	9	68	8.85	8.96	9.26
2013/14	Physics 2	9	92	8.87	9.27	9.53
2012/13	Physics 2	9	76	8.85	8.93	8.46
2011/12	Physics 2	9	55	9.59	9.69	9.69
2010/11	Physics 2	6	66	8.39	7.94	8.00

SUMMARY OF SCIENTIFIC PUBLICATIONS & SEMINARS

- Author of **64 scientific papers** on peer-reviewed JCR-indexed journals:
  - 45+ of which without the Ph.D. Supervisor,
  - 15 publications as first author;
  - 28 publications as corresponding author
  - 10 publications as last author
  - 1542 Total Citations, H Index = 23, G Index = 35, (Source: Scopus @ 24th July 2019)
  - Updated publication list and statistics are available at:
    - ORCID: https://orcid.org/0000-0002-3087-8602
    - Scopus: https://www.scopus.com/authid/detail.uri?authorId=6506298080,
    - ResearcherID: https://publons.com/a/1178296/
    - Google Scholar: https://scholar.google.com/citations?user=uuhhvdgAAAAJ&hl
    - Research Gate https://www.researchgate.net/profile/Paolo_Minzioni
- Author of **90+ conference contributions** (international conferences only)
- Author of **2 book chapters**:
- Author of **8 invited papers** published by IEEE, MDPI and IOP
- Author of **5 granted patents**
- Author of **10+ invited seminars** in foreign universities and centers including (but not limited to): Aston University (UK) Peking University (CN), University of California Irvine (US) Chinese Academy of Sciences (CN), Manipal University, Jaipur (IN), University of California Los Angeles (US).
- **Guest Editor of 5 Special Issues**:
  - *"Silicon Photonics Components and Applications"* by MDPI Applied Sciences (2016)
  - *"Cell manipulation and analysis in microfluidic chips"* by De Gruyter Optofluidics, Microfluidics and Nanofluidics (2017)
  - *"Roadmap Paper on Optofluidics"* by IOP Journal of Optics (2017)
  - *"Optofluidics: From Fundamental Research to Applications"* by MDPI Micromachines (2017)
  - *"Roadmap Paper on All-Optical Processing"* by IOP Journal of Optics (2019)

MAIN COLLABORATIONS (OUTSIDE UNIVERSITY OF PAVIA) & REFERENCE PERSONS

- **Pirelli Labs** (Milano, Italy): Alessandro Schiffini, Maurizio Tormen
- **Università degli studi di Padova** (Padova, Italy): Andrea Galtarossa, Cinzia Sada, Marco Bazzan
- **Paderborn University** (Paderborn, Germany): Hubertus Suche, Wolfgang Sohler
- **Stanford University** (Stanford, CA, USA): Carsten Langrock, Martin M. Fejer
- **Hebei University of Technology** (Tianjin, China): Wenbo Yan
- **Istituto Italiano di Tecnologia** (Genova, Italy): Francesco De Angelis, Enzo Di Fabrizio
- **King Abdullah University of Science and Technology** (Thuwal, Saudi Arabia): Carlo Liberale
- **Glasgow University** (Glasgow, UK): Marc Sorel
- **CEA Leti** (Grenoble, France): Maryse Fournier, Benoit Charbonnier
- **Politecnico di Milano** (Milano, Italia): Mario Martinelli, Roberto Osellame,
- **Optical Research Center** (Southampton, UK): Periklis Petropoulos.

PUBLICATIONS ON INTERNATIONAL PEER-REVIEWED JOURNALS APPEARING ON JCR (* is used to indicate the corresponding author)

1. A. Pizzinat*, A. Schiffini, F. Alberti, A. Paoletti, D. Caccioli, P. Griggio, **P. Minzioni**, F. Matera
"Numerical and experimental comparison of dispersion compensation techniques on different fibers"
IEEE Photonics Technology Letters, Vol.14, Issue 10, pp. 1415-1417, October 2002.
DOI: 10.1109/LPT.2002.802373

2. A. Schiffini*, A. Paoletti, P. Griggio, **P. Minzioni**, G. Contestabile, A. D'Ottavi, F. Martelli
"4x40 Gbit/s transmission in a 500 Km long, Dispersion-Managed link, with in-line all-optical wavelength conversion"
Electronics Letters, Vol.38, Issue 24, pp. 1558-1560, November 2002
DOI: 10.1049/el:20020962

3. **P. Minzioni***, F. Alberti, A. Schiffini
"Optimized Link Design for Non Linearity Cancellation by Optical Phase Conjugation"
IEEE Photonics Technology Letters, Vol. 16, Issue 3, pp.813-815, March 2004.
DOI: 10.1109/LPT.2004.823754

4. D. Caccioli, A. Paoletti, A. Schiffini, A. Galtarossa*, P.Griggio, G. Lorenzetto, **P. Minzioni**, S. Cascelli, M. Guglielmucci, L. Lattanzi, F. Matera, G.M. Tosi Beleffi, V. Quiring, W. Sohler, H. Suche, S. Vehovc, M. Vidmar
"Field demonstration of in-line all-optical wavelength conversion in a WDM dispersion managed 40 Gb/s link"
IEEE Journal of Selected Topics in Quantum Electronics, Vol. 10, Issue 2, pp. 356-362, March-April 2004
DOI: 10.1109/JSTQE.2004.827838

5. L. Razzari, **P. Minzioni**, I. Cristiani*, V. Degiorgio, E.P. Kokanyan
"*Photorefractivity of Hafnium-doped congruent lithium-niobate crystals*"
Applied Physics Letters, Vol. 86, pp. 131914-131916, March 2005
DOI: 10.1063/1.1895478

6. **P. Minzioni***, F. Alberti, A. Schiffini
"Techniques for Non Linearity Cancellation into Embedded Links by Optical Phase Conjugation"
IEEE/OSA Journal of Lightwave Technology, Vol. 23, Issue 8, pp. 2364-2370, August 2005
DOI: 10.1109/JLT.2005.850806

7. **P. Minzioni***, M. Tormen
"Effect of Multi Path Interference in Cascaded Bragg Gratings Filters"
IEEE Photonics Technology Letters, Vol. 17, Issue 9, pp. 1896-1898, September 2005
DOI: 10.1109/LPT.2005.852316

8. A. Schiffini*, A. Paoletti, D. Caccioli, **P. Minzioni**, H. Suche, Y. L. Lee, A. Galtarossa, P. Griggio, G. Lorenzetto, F. Matera, G. M. Tosi-Beleffi, F. Curti, M. Guglielmucci, S. Cascelli, L. Lattanzi, M. Vidmar, P. Monteiro
"In-Field n × 40 Gb/s Transmission Experiments with In-Line All-Optical Wavelength Conversion"
Taylor & Francis, Fiber & Integrated Optics, Vol. 24, Issue 5, pp. 471-489, September-October 2005
DOI: 10.1080/01468030590966571

9. **P. Minzioni***, A. Schiffini
"Unifying theory of compensation techniques for intrachannel nonlinear effects"
Optics Express, Vol. 13, No. 21, pp. 8460-8468, October 2005
DOI: 10.1364/OPEX.13.008460

10. **P. Minzioni***, M. Tormen
"Bragg-Gratings: Impact of Apodization Lobes and Design of a Dispersionless Optical Filter"
IEEE/OSA Journal of Lightwave Technology, Vol. 24, Issue 1, pp. 605-611, January 2006
DOI: 10.1109/JLT.2005.859859

11. P. Galinetto*, F. Rossella, **P. Minzioni**, L. Razzari, I. Cristiani, V. Degiorgio, E.P. Kokanyan
"MicroRaman and Photorefractivity Study of Hafnium Doped Lithium Niobate Crystals"
Journal of Nonlinear Optical Physics & Materials, Vol. 15, No. 1, pp. 9-21, March 2006
DOI: 10.1142/S021886350600313X

12. **P. Minzioni***, I. Cristiani, V. Degiorgio, L. Marazzi, M. Martinelli, C. Langrock, M.M. Fejer
"*Experimental Demonstration of Nonlinearity and Dispersion Compensation in an Embedded Link by Optical Phase Conjugation*"
IEEE Photonics Technology Letters, Vol. 18, Issue 9, pp. 995-997, May 2006
DOI: 10.1109/LPT.2006.873547

13. **P. Minzioni***, I. Cristiani, V. Degiorgio, E.P.Kokanyan
"Strongly sublinear growth of the photorefractive effect for increasing pump intensities in doped lithium-niobate crystals"
Journal of Applied Physics, Vol. 101, Issue 11, 116105, June 2007
DOI: 10.1063/1.2739354

14. **P. Minzioni***, I. Cristiani, J. Yu, J. Parravicini, E. P. Kokanyan, V. Degiorgio
"Linear and nonlinear optical properties of Hafnium-doped lithium-niobate crystals"
Optics Express, Vol. 15, No.21, pp. 14171-14176, October 2007
DOI: 10.1364/OE.15.014171

15. V. Annovazzi-Lodi*, G. Aromataris, M. Benedetti, I. Cristiani, S. Merlo, **P. Minzioni**,
"All-Optical Wavelength Conversion of a Chaos Masked Signal"
IEEE Photonics Technology Letters, Vol. 19, Issue 22, pp.1783-1785, November 2007
DOI: 10.1109/LPT.2007.906847

16. C. Liberale, **P. Minzioni***, F. Bragheri, F. De Angelis, E. Di Fabrizio, I. Cristiani
"Miniaturized all-fiber probe for three dimensional optical trapping, manipulation and analysis"
Nature Photonics, Vol. 1, No.12, pp. 723-727, December 2007,
DOI: 10.1038/nphoton.2007.230

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