

Dr. Ir. Marc Sciamanna

Contact

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Personal data

Date of Birth	27-10-1977
Place of Birth	Mons (Belgium)
Nationality	Belgian & Italian
Marital Status	Married

Position

Associate Professor, Supélec
Head of SPC Major (Photonic Systems & Communication)
Researcher in the frame of laboratory LMOPS CNRS UMR-7132 (Supélec, UPVM)
Adjunct Professor - Georgia Tech Institute of Technology (USA)

Education

July 2000	Engineer, Master in Electrical Engineering, Faculté Polytechnique de Mons, Belgium, with the highest distinction, summa cum laude.
January 2004	PhD in Applied Sciences, Faculté Polytechnique de Mons, Belgium, with the highest distinction, summa cum laude.

Professional career

1999	Internship at Ion Beam Applications (IBA, Louvain-la-Neuve, Belgique), on the topic of project scheduling for cyclotron production.
2000	Summer Student at CERN (Genève, Switzerland), on the topic of methodology and implementation of detection control system in the frame of ALICE experiment (LHC).
2000-2004	PhD - Fonds National de la Recherche Scientifique (FNRS), Belgique
2004-?	Professor, Supélec, France

Research topics

- Nonlinear dynamics of semiconductor lasers
- All-optical generation of fast electrical signals
- Fast all-optical switching
- Optical chaos and application to cryptography
- Synchronization of coupled lasers and application to secure optical communications

Research facts

Publications (journals)	40
Publications (conference proceedings)	52
Oral Conference Communications	31
Poster Conference Communications	18
Invited talks	14
Conference Program Committee Member	7
Conference Chair	4
PhD examiner	4
European Projects	3
National Projects	1
International Scientific Awards	4
National Scientific Awards	1

Awards

- 2000 Best Engineer in Electricity, Faculté Polytechnique de Mons (FPMs)
- 2002 *IEEE/LEOS Graduate Student Fellowship Award* received at Glasgow (UK), on November 11, 2002 during the LEOS Annual Meeting.
- 2002 *OSA Newfocus Student Travel Grant* received at Orlando (Florida, USA) during the OSA Annual Meeting 2002 (September 29 - October 3).
- 2003 *SPIE F-MADE Scholarship Award*, received at San Diego (CA, USA) on August 5, 2003 during the SPIE Award Ceremony.
- Official Statement : « Sponsored by the Forum for Military Applications of Directed Energy (F-MADE), the Award is given "for his recognition of scholarly achievements in laser technology, engineering, or applications" »
- 2007 *MIT 2007 Young Innovator TR35 Award*, which is given by MIT Technology Review to 35 scientists being less than 35 years old for the technological impact of their research. Award received during the international conference « Emerging Technologies Conference », MIT,

25-28 September 2007.

The awarded research work concerns « Controlling Chaos in Telecom Lasers ». Press article published in the newspaper le Républicain Lorrain (18 September 2007).

Main scientific contributions

- Chaos synchronization and message encryption/decoding using semiconductor lasers coupled through incoherent optical injection (2001)
- Physics of polarization self-modulation in VCSELs with polarization rotating optical feedback (2002)
- All-optical microwave signal using a laser diode with optical feedback (2002)
- Mechanisms underlying the occurrence of low-frequency fluctuation chaotic regime in VCSELs with optical feedback (2003)
- Polarization chaos in VCSELs with large current modulation (2003)
- Polarization control in VCSELs with optical feedback (2003)
- Coherence resonance in VCSELs with optical feedback – when noise makes the dynamics more regular! (2004)
- High frequency laser dynamics using short external cavity – pulse package dynamics (2004-2006)
- Optical chaos in VCSELs with orthogonal optical injection (2005-2006)
- Coherence resonance in a bistable system with delay (2007)
- Loss of time delay information in the chaotic time trace of a laser (2007)
- Synchronization of mutually coupled VCSELs (2008)
- Polarization switching in quantum dot VCSEL (2009)

International activities

- Examiner of PhD theses – Jury member (4):
 - Andrzej Tabaka (2004, VUB, Belgium): *Complex Dynamics Induced by Optical Feedback in Semiconductor Lasers: case studies for short external cavity and for polarization mode competition*
 - Dominique Heinis (2005, UFC, France): *Vers l'intégration de système de detection SNOM basé sur l'effet de la reinjection optique dans un VCSEL*
 - Raul Vicente (2006, UIB, Spain): *Nonlinear Dynamics and Synchronization of Bidirectionally Coupled Semiconductor Lasers*
 - Mikel Arizaleta (2007, UPC, Spain & VUB, Belgium): *Extremely short external cavity VCSELS: a novel approach to control polarization and to study temporal dynamics*
- Reviewer in international journals (14) : Physical Review E, Physical Review A, Physical Review B, Physical Review Letters, IEEE Journal of Quantum Electronics, IEEE Photonics Technology Letters, IEEE Journal of Lightwave Technology, Optics Communications, Physica D, Optics Letters, Journal of the Optical Society of America B, Optical Engineering, Applied Physics Letters, Journal of Applied Physics.
- Guest Editor of the journal « Optical and Quantum Electronics » (Springer) for the special issues related to the workshops PHASE 2005, PHASE 2007 and IPSSO 2007.
- COST 288 European Action “Nanoscale and Ultrafast Photonics”: vice-chair of working group “Physics of Devices” and French National Delegate.
- COST P11 European Action “Physics of linear, nonlinear and active photonic crystals”: participant.
- COST MP0702 European Action “Towards Functional Sub-Wavelength Photonic Structures”: co-chairman of working group 3 “New functionalities”.
- Participant in the project MIREV (funded by ANR – Ministère de la Recherche) concerning the fabrication of mid-infrared VECSELS for spectroscopy applications.
- Board member of IEEE/LEOS Benelux Chapter (2001-2004) and co-founder of IEEE/LEOS Benelux Student Chapter.

- Chair of the international workshop « Low-Cost Photonics » (Mons, Belgium, June 13, 2003).
- Chair of the international workshop PHASE (PHysics and Applications of Semiconductor LASERs) (Metz, France, March 29-30, 2005).
- Chair of scientific sessions in international conferences: CLEO Europe 2005, SPIE Photonics Europe 2006, ICTON 2007, SPIE Photonics Europe 2008.
- Program Committee Member of SPIE Photonics Europe 2006.
- Chair of the international workshops PHASE 2007 (PHysics and Applications of Semiconductor LASERs) and IPSSO 2007 (Instabilities, Patterns and Spatial Solitons) (Metz, France, March 28-30, 2007).
- Co-chair of the international conference « Semiconductor lasers and laser dynamics » in the frame of SPIE Photonics Europe 2008.
- Program Committee Member of the Topical Meeting “Nonlinear Optics: Materials, Devices and Spatio-Temporal Effects”, at the EOS (European Optical Society) Annual Meeting (Paris, September 29-October 02, 2008).
- Program Committee Member of the IEEE/LEOS Winter Topical Meeting Series on “Nano and Nonlinear Photonics” (Innsbruck, Austria, January 12-14, 2009).
- Member of the Board of SFO/SEE Club on “Systèmes Optroniques pour l’Observation et la Surveillance” (S2OS).

Teaching activities and Master/PhD supervision

3rd year – Supelec engineer

- Lectures « Photonic Components » (7.5h C + 6h TD)
- Lectures « Nonlinear optics and applications to photonic systems » (12h C + 3h TD)
- Lectures « Hot topics in photonics » (6h C + 3h TD)
- Lab exercices « Data networks » (8h)
- Supervision of final year projects

2nd year – Supelec engineer

- Exercices « Semiconductor components » (6h TD)
- Exercices « Numerical methods and optimization » (6h TD)

1st year – Supelec engineer

- Exercices « Field and propagation » (6h TD)
- Exercices « Solid state physics » (6h TD)

PhD Advisor (4)

- Ignace GATARE, PhD in international double PhD program between Université Paul Verlaine de Metz and Vrije Universiteit Brussel (VUB, Belgique) : « *Polarization switching, Locking and Synchronization in VCSELS subject to optical injection* » (February 8, 2008)
- Damien RONTANI, PhD at Georgia Institute of Technology (Atlanta, U.S.A.) : « *Nonlinear dynamics of photonic components and applications to chaos cryptography* » (expected : December 2009)
- Nicolas MARSAL, PhD at Université Paul Verlaine de Metz : « *Dynamical instabilities in photorefractive cavities* » (expected : October 2010)
- Lukasz OLEJNICZAK, PhD in international double PhD program between Université Paul Verlaine de Metz and Vrije Universiteit Brussel (VUB, Belgique) : « *Polarization properties and nonlinear dynamics of quantum dot VCSELS* » (expected : October 2010)

Supervision of Master Student projects (5)

- Gérard Monticelli (FPMs, Belgique, 2003) : « *Etude de l'injection optique sur la dynamique de polarisation d'un VCSEL* »
- Marc Triginer (VUB, Belgique, 2003) : « *Study of polarization switching in VCSELS induced by optical injection* »
- Ignace Gatare (FPMs, Belgique, 2004) : « *Contrôle de la dynamique de polarisation d'un laser à semi-conducteur de type VCSEL par injection optique de lumière polarisée* »
- Javier Hernandez Archutegui (VUB, Belgique, 2004) : « *Edge Emitting Lasers subject to optical Feedback from extremely short external Cavity* »
- Jordi Buesa (VUB, Belgique, 2005) : « *Mapping of the dynamics induced by optical injection in VCSELS* »

Supervision of Engineer Student projects (7)

C. Lalart, N. Mercier, A. Tencé (Supélec, 2001)
B. Dorléans, S. Joulin (Supélec, 2002)

O. Salomon, H. Hermand (Supélec, 2006)
Benjamin Bailly, Hocine Ettayeb. (Supélec, 2006)
A. Rodriguez, R. Pigeon (Supélec, 2007)
J. Fernandez, V. Ravindran, A. Puri (Supélec, 2007)
H. Mousavi, A. Bourrouis (Supélec, 2008)

Detailed List of Publications

Peer-reviewed journals

ART-1. “Low-frequency fluctuation regime in a multimode semiconductor laser subject to a mode-selective optical feedback”, F. Rogister, M. Sciamanna, O. Deparis, P. Mégret, M. Blondel, Phys. Rev. A 65, 015602 (2001).

ART-2. “Two types of synchronization in two distant unidirectionally coupled chaotic external-cavity semiconductor lasers”, A. Locquet, F. Rogister, M. Sciamanna, P. Mégret, M. Blondel, Phys. Rev. E 64, 045203 (2001).

ART-3. “Secure communication scheme using chaotic laser diodes subject to incoherent optical feedback and incoherent optical injection”, F. Rogister, A. Locquet, D. Pieroux, M. Sciamanna, O. Deparis, P. Mégret, M. Blondel, Opt. Lett. 26, 1486 (2001).

ART-4. “Bifurcation to polarization self-modulation in vertical-cavity surface-emitting lasers”, M. Sciamanna, F. Rogister, O. Deparis, P. Mégret, M. Blondel, T. Erneux, Opt. Lett. 27, 261 (2002).

ART-5. “Bifurcation bridges between external-cavity modes lead to polarization self-modulation in vertical-cavity surface-emitting lasers”, M. Sciamanna, T. Erneux, F. Rogister, O. Deparis, P. Mégret, M. Blondel, Phys. Rev. A 65, 041801(R) (2002).

ART-6. “Stable microwave oscillations due to external-cavity mode beating in laser diodes subject to optical feedback”, T. Erneux, A. Gavrielides, M. Sciamanna, Phys. Rev. A 66, 033809 (2002).

ART-7. “Anticipating synchronization of two chaotic laser diodes by incoherent optical coupling and its application to secure communications”, F. Rogister, D. Pieroux, M. Sciamanna, P. Mégret, M. Blondel, Opt. Comm. 207, 295 (2002).

ART-8. “Different regimes of low-frequency fluctuations in vertical-cavity surface-emitting lasers”, M. Sciamanna, C. Masoller, N.B. Abraham, F. Rogister, P. Mégret, M. Blondel, J. Opt. Soc. Am. B 20, 37 (2003).

ART-9. “Nonlinear polarization dynamics in directly modulated vertical-cavity surface-emitting lasers”, M. Sciamanna, A. Valle, P. Mégret, M. Blondel, K. Panajotov, Phys. Rev. E 68, 016207 (2003).

ART-10. “Fast pulsing dynamics of a vertical-cavity surface-emitting laser operating in the low frequency fluctuation regime”, M. Sciamanna, C. Masoller, F. Rogister, P. Mégret, N.B. Abraham, M. Blondel, Phys. Rev. A 68, 015805 (2003).

ART-11. "Optical feedback induces polarization mode-hopping in vertical-cavity surface-emitting lasers", M. Sciamanna, K. Panajotov, H. Thienpont, I. Veretennicoff, P. Mégret, M. Blondel, *Opt. Lett.* 28, 1543 (2003).

ART-12. "Nonlinear dynamics in delayed semiconductor lasers: from fundamental research to telecom applications", M. Sciamanna, *Revue HF* 2, 35 (2003).

ART-13. "Residence time distribution and coherence resonance of optical feedback induced polarization mode-hopping in vertical-cavity surface-emitting lasers", K. Panajotov, M. Sciamanna, A. Tabaka, P. Mégret, M. Blondel, G. Giacomelli, F. Marin, H. Thienpont, I. Veretennicoff, *Phys. Rev. A* 69, 011801(R) (2004).

ART-14. "Hopf bifurcation cascade in small alpha laser diodes subject to optical feedback", M. Sciamanna, P. Mégret, M. Blondel, *Phys. Rev. E* 69, 046209 (2004).

ART-15. "Bifurcation study of regular pulse packages in laser diodes subject to optical feedback", A. Tabaka, K. Panajotov, I. Veretennicoff, and M. Sciamanna, *Phys. Rev. E* 70, 036211 (2004).

ART-16. "Intensity behavior underlying pulse packages in semiconductor lasers subject to optical feedback", M. Sciamanna, A. Tabaka, H. Thienpont, and K. Panajotov, *J. Opt. Soc. Am. B* 22, 777 (2005).

ART-17. "Two-mode injection locking in vertical-cavity surface-emitting lasers", M. Sciamanna, K. Panajotov, *Opt. Lett.* 30, 2903 (2005).

ART-18. "Dynamics of vertical-cavity surface-emitting lasers in the short external cavity regime: Pulse packages and polarization mode competition", A. Tabaka, M. Peil, M. Sciamanna, I. Fischer, W. Elsässer, I. Veretennicoff, H. Thienpont, K. Panajotov, *Phys. Rev. A* 73, 013810 (2006).

ART-19. "Mapping of the dynamics induced by orthogonal optical injection in vertical-cavity surface-emitting lasers", J. Buesa, I. Gatare, K. Panajotov, H. Thienpont, and M. Sciamanna, *IEEE Journal of Quantum Electronics* 42, 198 (2006).

ART-20. "Route to polarization switching induced by optical injection in vertical-cavity surface-emitting lasers", M. Sciamanna, K. Panajotov, *Physical Review A* 73, 023811 (2006).

ART-21. "Nonlinear dynamics accompanying polarization switching in vertical-cavity surface-emitting lasers with orthogonal optical injection", I. Gatare, M. Sciamanna, J. Buesa, H. Thienpont, K. Panajotov, *Applied Physics Letters* 88, 101106 (2006).

ART-22. "Introduction to the special issue of Optical and Quantum Electronics related to the workshop « PPhysics and Applications of SEMiconductor LASERs » (PHASE)", M. Sciamanna and K. Panajotov, *Optical and Quantum Electronics* 38, 275-279 (2006).

ART-23. "Polarization switching bistability and dynamics in vertical-cavity surface-emitting laser under orthogonal optical injection", I. Gatare, J. Buesa, H. Thienpont, K. Panajotov, and M. Sciamanna, *Optical and Quantum Electronics* 38, 429-443 (2006).

ART-24. "Bistable polarization switching in mutually coupled vertical-cavity surface-emitting lasers", R. Vicente, J. Mulet, C.R. Mirasso, M. Sciamanna, *Opt. Lett.* 31, 996 (2006).

ART-25. "Frequency-induced polarization bistability in vertical-cavity surface-emitting lasers with orthogonal optical injection", I. Gatare, M. Sciamanna, K. Panajotov, *Physical Review A* 75, 023804 (2007).

ART-26. "Transverse Mode Switching and Locking in Vertical-Cavity Surface-Emitting Lasers Subject to Orthogonal Optical Injection", A. Valle, I. Gatare, K. Panajotov, M. Sciamanna, *IEEE Journal of Quantum Electronics* 43, 322 (2007).

ART-27. "Polarization synchronization in unidirectionally coupled vertical-cavity surface-emitting lasers", M. Sciamanna, I. Gatare, A. Locquet, K. Panajotov, *Phys. Rev. E* **75**, 056213 (2007).

ART-28. "Influence of polarization mode competition on the synchronization of two unidirectionally coupled vertical-cavity surface-emitting lasers", I. Gatare, M. Sciamanna, A. Locquet, K. Panajotov, *Opt. Lett.* 32, 1629 (2007).

ART-29. "Experimental evidence of coherence resonance in a time-delayed bistable system", M. Arizaleta Arteaga, M. Valencia, M. Sciamanna, H. Thienpont, M. Lopez-Amo, K. Panajotov, *Phys. Rev. Lett.* 99, 023903(2007).

ART-30. "Loss of time-delay signature in the chaotic output of a semiconductor laser with optical feedback", D. Rontani, A. Locquet, M. Sciamanna, D. Citrin, *Opt. Lett.* 32, 2960 (2007).

ART-31. "Bifurcation to polarization switching and locking in vertical-cavity surface-emitting lasers with optical injection", I. Gatare, M. Sciamanna, M. Nizette, K. Panajotov, *Phys. Rev. A* 76, 031803 (2007).

ART-32. "Nonlinear dynamics of the polarization of multitransverse mode vertical-cavity surface-emitting lasers under current modulation", A. Valle, M. Sciamanna, and K. Panajotov, *Phys. Rev. E.* 76, 046206 (2007).

ART-33. "Irregular pulsating polarization dynamics in gain-switched vertical-cavity surface-emitting lasers", A. Valle, K. Panajotov, M. Sciamanna, *IEEE Journal of Quantum Electronics* 44, 136 (2008).

ART-34. "Introduction to the special issue of *Optical and Quantum Electronics* related to the workshops « *PHysics and Applications of SEMiconductor LASERs* » (PHASE 2007)

and « Instabilities, Patterns and Optical Solitons » (IPSSO 2007)”, M. Sciamanna , D. Wolfersberger, K. Panajotov, Optical and Quantum Electronics 40, 2-4 (2008).

ART-35. "Transverse mode competition effects on the dynamics of gain-switched vertical-cavity surface-emitting lasers", A. Valle, M. Arizaleta, H. Thienpont, K. Panajotov, M. Sciamanna, Appl. Phys. Lett. 93, 131103 (2008).

ART-36. "Experimental control of pattern formation by photonic lattices", N. Marsal, D. Wolfersberger, M. Sciamanna, G. Montemezzani, D. Neshev, Opt. Lett. 33, 2509 (2008).

ART-37. "Impact of light polarization on chaos synchronization of mutually coupled VCSELs", K. Panajotov, M. Sciamanna, H. Thienpont, A. Uchida, Opt. Lett. 33, 3031 (2008).

ART-38. " Leader-laggard relationship of chaos synchronization in mutually coupled vertical-cavity surface-emitting lasers with time delay", M. Ozaki, H. Someya, T. Mihara, A. Uchida, S. Yoshimori, K. Panajotov, and M. Sciamanna, Phys. Rev. E 79, 026210 (2009).

ART-39. " Time-delay identification in the chaotic output of a semiconductor laser with optical feedback: a dynamical point of view", D. Rontani, A. Locquet, M. Sciamanna, D. Citrin, IEEE Journal of Quantum Electronics, to appear (2009).

ART-40. "Polarization switching in quantum dot Vertical-Cavity Surface-Emitting Lasers", L. Olejniczak, M. Sciamanna, H. Thienpont, K. Panajotov, A. Mutig, F. Hopfer, D. Bimberg, IEEE Photonics Technology Letters, to appear (2009).

Conference Proceedings

CONF-1. "Numerical observation of in-phase and out-of-phase behaviors in the polarized modes of a vertical-cavity surface-emitting laser operating in the low-frequency fluctuations regime", M. Sciamanna, F. Rogister, P. Mégret, M. Blondel, Proc. of IEEE/LEOS Symposium - Benelux Chapter, pp 155-158 (2000).

CONF-2. "Numerical study of the picosecond intensity behavior in a vertical cavity surface-emitting laser operating in the low-frequency fluctuations regime", M. Sciamanna, F. Rogister, P. Mégret, M. Blondel, Proc. of IEEE/LEOS Annual Meeting 1, 135-136 (2000).

CONF-3. "Statistical study of the time between total power dropouts in a VCSEL operating in the low-frequency fluctuations regime", M. Sciamanna, F. Rogister, A. Locquet, P. Mégret, M. Blondel, Techn. Digest of CLEO/Pacific Rim 2, pp 172-173 (2001).

CONF-4 "Dynamical behavior of a multimode semiconductor laser subject to a single mode selective optical feedback", F. Rogister, M. Sciamanna, A. Locquet, O. Deparis, P. Mégret, M. Blondel, Techn. Digest of CLEO/Pacific Rim 2, pp 170-171 (2001).

CONF-5. "Synchronization of chaotic semiconductor lasers with phaseconjugated feedback", A. Locquet, F. Rogister, M. Sciamanna, P. Mégret, M. Blondel, Techn. Digest of CLEO/Pacific Rim 2, pp 338-339 (2001).

CONF-6. "Polarisation self-modulation in a VCSEL subject to optical feedback from a quarter-wave plate", M. Sciamanna, T. Erneux, F. Rogister, O. Deparis, P. Mégret, M. Blondel, Proc. of IEEE/LEOS Annual Meeting 2, pp 443-444 (2001).

CONF-7. "Bifurcation to polarization self-modulation in vertical-cavity surface-emitting lasers", M. Sciamanna, T. Erneux, F. Rogister, O. Deparis, P. Mégret, M. Blondel, Proc. of IEEE/LEOS Symposium - Benelux Chapter, pp 117-120 (2001).

CONF-8. "Optical feedback induces polarization mode-hopping in vertical-cavity surface-emitting lasers", M. Sciamanna, K. Panajotov, P. Mégret, H. Thienpont, M. Blondel, I. Veretennicoff, VCSELS and Optical Interconnects, SPIE Proc. , eds. H. Thienpont, J. Danckaert, vol. 4942, pp 103-111 (2003).

CONF-9. "Different regimes of low-frequency fluctuations in vertical-cavity surface-emitting lasers", M. Sciamanna, C. Masoller, N.B. Abraham, F. Rogister, P. Mégret, M. Blondel, VCSELS and Optical Interconnects, SPIE Proc., eds. H. Thienpont, J. Danckaert, vol. 4942, pp 345-354 (2003).

CONF-10. "All-optical microwave oscillations and pulsating dynamics in laser diodes with short external cavity", M. Sciamanna, T. Erneux, A. Gavrielides, V. Kovanis, P. Mégret, M. Blondel, Proc. of IEEE/LEOS Annual Meeting 1, pp 153-154 (2002).

CONF-11. "Optical feedback induces polarization mode hopping in vertical-cavity surface-emitting lasers", M. Sciamanna, K. Panajotov, H. Thienpont, P. Mégret, M. Blondel, I. Veretennicoff, Proc. of IEEE/LEOS Annual Meeting 1, pp 157-158 (2002).

CONF-12. "Bifurcation study of regular pulse packages in laser diodes subject to optical feedback", A. Tabaka, M. Sciamanna, I. Veretennicoff, and K. Panajotov, Proc. of IEEE/LEOS Symposium-Benelux Chapter, pp 43-46 (2002).

CONF-13. "High frequency dynamics in delayed semiconductor lasers with short external cavity", M. Sciamanna, T. Erneux, A. Gavrielides, V. Kovanis, P. Mégret, and M. Blondel, Physics and Simulation of Optoelectronic Devices XI, SPIE Proc. , eds. M. Osinski, H. Amano, P. Blood, vol. 4986, pp 469-479 (2003).

CONF-14. "Nonlinear polarization dynamics in current-modulated vertical-cavity surface-emitting lasers", M. Sciamanna, A. Valle, P. Mégret, M. Blondel, K. Panajotov,

Physics and Simulation of Optoelectronic Devices XI, SPIE Proc. , eds. M. Osinski, H. Amano, P. Blood, vol. 4986, pp 273-284 (2003).

CONF-15. "Polarization mode hopping in vertical-cavity surface-emitting lasers, induced by optical feedback", K. Panajotov, M. Sciamanna, P. Mégret, H. Thienpont, M. Blondel, I. Veretennicoff, Physics and Simulation of Optoelectronic Devices XI, SPIE Proc., eds. M. Osinski, H. Amano, P. Blood, vol. 4986, pp 502-512 (2003).

CONF-16. "Polarization dynamics in VCSELs subject to optical injection", M. Sciamanna, K. Panajotov, G. Monticelli, A. Tabaka, H. Thienpont, I. Veretennicoff, P. Mégret, M. Blondel, S. Bandyopadhyay, Y. Hong, K.A. Shore, Techn. Digest of CLEO Europe/EQEC 2003, Proceeding on CD-ROM, paper EA-11438.

CONF-17. "Residence time distribution of noise induced hopping in bistable system with delay", K. Panajotov, M. Sciamanna, A. Tabaka, H. Thienpont, I. Veretennicoff, P. Mégret, M. Blondel, F. Marin, G. Giacomelli, Techn. Digest of CLEO Europe/EQEC 2003, Proceeding on CD-ROM, paper EA-11453.

CONF-18. "Bifurcation study of regular pulse packages in laser diodes subject to optical feedback", A. Tabaka, M. Sciamanna, I. Veretennicoff, K. Panajotov, Techn. Digest of CLEO Europe/EQEC 2003, Proceeding on CD-ROM, paper EA-10746.

CONF-19. "Dynamical effects of optical feedback in a laser diode with small alpha factor: an oasis of stability?", M. Sciamanna, P. Mégret, M. Blondel, Proc. of IEEE/LEOS Symposium-Benelux Chapter, pp 17-20 (2003).

CONF-20. "Mapping of delayed dynamics in short external cavity", A. Tabaka, M. Sciamanna, I. Veretennicoff, K. Panajotov, Proc. of IEEE/LEOS Symposium-Benelux Chapter, pp 113-116 (2003).

CONF-21. "Simple interpretation of the dynamics of two mutually coupled semiconductor lasers with detuning", R. Vicente, J. Mulet, M. Sciamanna, C.R. Mirasso, Physics and Simulation of Optoelectronic Devices XII, SPIE Proc., eds. M. Osinski, H. Amano, F. Henneberger, vol. 5349, pp 307-318 (2004).

CONF-22. "Mapping of delayed dynamics in short external cavity", A. Tabaka, M. Sciamanna, I. Veretennicoff, K. Panajotov, S Semiconductor Lasers and Laser Dynamics, SPIE Proc., eds. D. Lenstra, G. Morthier, T. Erneux, M. Pessa, vol. 5452, pp 93-104 (2004).

CONF-23. "Coherence resonance in a bistable laser system with time delay", M. Sciamanna, K. Panajotov, A. Tabaka, P. Mégret, M. Blondel, H. Thienpont, and I. Veretennicoff, Fluctuations and Noise in Photonics and Quantum Optics II, SPIE Proc., ed. P. Hezler, vol. 5468, pp 142-153 (2004).

CONF-24. "Dynamique de polarisation dans un laser VCSEL soumis à injection optique", M. Sciamanna, K. Panajotov, I. Gatere, M. Triginer, H. Thienpont, Proceedings

of Journées Nationales d'Optique Guidée (JNOG), 25-27 October 2004, Paris, France, pp 200-202 (2004).

CONF-25. "Experimental mapping of polarization dynamics induced by optical injection in VCSELs", M. Triginer, I. Gatare, H. Thienpont, M. Sciamanna, and K. Panajotov, Proceedings of IEEE/LEOS Benelux Chapter Annual Symposium, pp. 151-154 (2004).

CONF-26. "Experimental study of polarization switching and polarization mode hopping induced by optical injection in VCSELs", I. Gatare, M. Triginer, H. Thienpont, K. Panajotov, and M. Sciamanna, Proceedings of IEEE/LEOS Benelux Chapter Annual Symposium, pp. 143-146 (2004).

CONF-27. "Experimental studies of pulse packages in short external cavity VCSELs", A. Tabaka, M. Peil, M. Sciamanna, I. Fischer, W. Elsäßer, H. Thienpont, I. Veretennicoff, and K. Panajotov, Proceedings of IEEE/LEOS Benelux Chapter Annual Symposium, pp. 163-166 (2004).

CONF-28. "Polarization switching and dynamics induced by optical injection in VCSELs", I. Gatare, M. Sciamanna, J. Buesa, H. Thienpont, K. Panajotov, Technical Digest of EQEC 2005, p. 125 (2005).

CONF-29. "Optical Switching with VCSELs", M. Sciamanna, Technical Digest of CLEO Europe 2005, p. 479 (2005).

CONF-30. "Polarization switching in VCSELs induced by optical injection", K. Panajotov, B. Ryvkin, E. Avrutin, I. Gatare, M. Triginer, J. Buesa, I. Veretennicoff, H. Thienpont, M. Sciamanna, Nonlinear Space-Time Dynamics, eds. Nikolai Rosanov; Stephano Trillo, Proc. of SPIE, vol. 6255, p. 625501 (2005).

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CONF-51. " Interface Solitons in Electro-Optically Configurable Waveguide Arrays", N. Marsal, I. Garanovich, T. Crasto, A. Mitchell, D. Wolfersberger, M. Sciamanna, G. Montemezzani, A. Sukhorukov, D. Neshev, Y. Kivshar, Technical Digest of CLEO Europe 2009, to appear.

CONF-52. " Polarization instabilities and nonlinear dynamics in a quantum dot laser", L. Olejniczak, M. Sciamanna, K. Panajotov, Technical Digest of ICTON 2009, to appear.

Conference talks (excepted invited talks)

COM-1. "Numerical study of the picosecond intensity behavior in a vertical cavity surface-emitting laser operating in the low-frequency fluctuations regime", M. Sciamanna, F. Rogister, P. Mégret, M. Blondel, LEOS 2000 Annual Meeting, Puerto Rico, U.S.A., 13-16 November 2000.

COM-2. "Synchronization of chaotic semiconductor lasers with phaseconjugated feedback", A. Locquet, F. Rogister, M. Sciamanna, P. Mégret, M. Blondel, CLEO/Pacific Rim 2001 conference, Chiba, Japan, 15-19 July 2001.

COM-3. "Polarisation self-modulation in a VCSEL subject to optical feedback from a quarter-wave plate", M. Sciamanna, T. Erneux, F. Rogister, O. Deparis, P. Mégret, M. Blondel, LEOS 2001 Annual Meeting, San Diego, California, U.S.A., 12-15 November 2001.

COM-4. "Optical feedback induces polarization mode-hopping in vertical-cavity surface-emitting lasers", M. Sciamanna, K. Panajotov, P. Mégret, H. Thienpont, M. Blondel, I. Veretennicoff, OSA Annual Meeting 2002, Orlando, Florida, U.S.A., 29 September - 3 October 2002.

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COM-6. "All-optical microwave oscillations and pulsating dynamics in laser diodes with short external cavity", M. Sciamanna, T. Erneux, A. Gavrielides, V. Kovanis, P. Mégret, M. Blondel, IEEE/LEOS 2002 Annual Meeting, Glasgow, U.K., 10-14 November 2002.

COM-7. "Optical feedback induces polarization mode hopping in vertical-cavity surface-emitting lasers", M. Sciamanna, K. Panajotov, H. Thienpont, P. Mégret, M. Blondel, I. Veretennicoff, IEEE/LEOS 2002 Annual Meeting , Glasgow, U.K., 10-14 November 2002.

COM-8. "Bifurcation study of regular pulse packages in laser diodes subject to optical feedback", A. Tabaka, M. Sciamanna, I. Veretennicoff, and K. Panajotov, IEEE/LEOS Annual Symposium of Benelux Chapter, Amsterdam, The Netherlands, on the 9th of December 2002.

COM-9. "Nonlinear dynamics in delayed semiconductor lasers: from fundamental research to telecom applications", M. Sciamanna, URSI Forum, Royal Military Academy, Brussel, Belgium, on the 13th of December 2002.

COM-10. "High frequency dynamics in delayed semiconductor lasers with short external cavity", M. Sciamanna, T. Erneux, A. Gavrielides, V. Kovanis, P. Mégret, and M. Blondel, SPIE Photonics West, San José, California (U.S.A.), 25-31 January 2003.

COM-11. "Nonlinear polarization dynamics in current-modulated vertical-cavity surface-emitting lasers", M. Sciamanna, A. Valle, P. Mégret, M. Blondel, K. Panajotov, SPIE Photonics West, San José, California (U.S.A.), 25-31 January 2003.

COM-12. "Polarization mode hopping in vertical-cavity surface-emitting lasers, induced by optical feedback", K. Panajotov, M. Sciamanna, P. Mégret, H. Thienpont, M. Blondel, I. Veretennicoff, SPIE Photonics West, San José, California (U.S.A.).

COM-13. "Residence time distribution of noise induced hopping in bistable system with delay", K. Panajotov, M. Sciamanna, A. Tabaka, H. Thienpont, I. Veretennicoff, P. Mégret, M. Blondel, F. Marin, G. Giacomelli, CLEO Europe/EQEC 2003, Munich, Germany, 23- 27 June 2003.

COM-14. "Dynamical effects of optical feedback in a laser diode with small alpha factor: an oasis of stability?", M. Sciamanna, P. Mégret, M. Blondel, IEEE/LEOS Annual Symposium of Benelux Chapter, Enschede, The Netherlands, 20-21 November 2003.

COM-15. "Simple interpretation of the dynamics of two mutually coupled semiconductor lasers with detuning", R. Vicente, J. Mulet, M. Sciamanna, C.R. Mirasso, SPIE Photonics West, San Jose, California (U.S.A.), 24-29 January 2004.

COM-16. "Mapping of delayed dynamics in short external cavity", A. Tabaka, M. Sciamanna, I. Veretennicoff, K. Panajotov, SPIE Photonics Europe, Strasbourg, France, 26-30 April 2004.

COM-17. "Coherence resonance in a bistable laser system with time delay", M. Sciamanna, K. Panajotov, A. Tabaka, P. Mégret, M. Blondel, H. Thienpont, and I. Veretennicoff, SPIE Fluctuations and Noise, 26-28 May 2004, Maspalomas, Gran Canaria Island.

COM-18. "Polarization switching and dynamics induced by optical injection in VCSELs", I. Gatere, M. Sciamanna, J. Buesa, H. Thienpont, K. Panajotov, CLEO Europe/EQEC 2005, 13-17 June 2005, Munich, Germany.

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COM-20. "Dynamics of vertical-cavity surface-emitting lasers in the short external cavity regime : pulse packages and polarization mode competition", A. Tabaka, M. Peil, M. Sciamanna, I. Fischer, W. Elsäber, H. Thienpont, I. Veretennicoff, K. Panajotov, SPIE Photonics Europe, 3-6 April 2006, Strasbourg, France.

COM-21. "Polarization switching dynamics and bistability in mutually coupled vertical-cavity surface-emitting lasers", R. Vicente, J. Mulet, C.R. Mirasso, M. Sciamanna, SPIE Photonics Europe, 3-6 April 2006, Strasbourg, France.

COM-22. "Nonlinear dynamics and polarization bistability in optically injected VCSELs", I. Gatere, J. Buesa, H. Thienpont, K. Panajotov, M. Sciamanna, SPIE Photonics Europe, 3-6 April 2006, Strasbourg, France.

COM-23. "Polarization dynamics in externally-driven VCSELs", K. Panajotov, I. Gatere, J. Buesa, H. Thienpont, M. Sciamanna, ICTON 2006, 18-22 June 2006, Nottingham, U.K.

COM-24. "Round-robin measurements of linewidth enhancement factor of semiconductor lasers in COST 288 action", G. Giuliani et al., CLEO/EQEC 2007, 17-22 June 2007, Munich, Germany.

COM-25. "Bifurcation and nonlinear dynamics accompanying polarization switching in a VCSEL subject to orthogonal optical injection", I. Gatare, M. Sciamanna, K. Panajotov, M. Nizette, CLEO/EQEC 2007, 17-22 June 2007, Munich, Germany.

COM-26. "Masking the time-delay from the chaotic output of an external-cavity laser", D. Rontani, A. Locquet, M. Sciamanna, D. Citrin, SPIE Photonics Europe 2008, 07-11 April 2008, Strasbourg, France.

COM-27. "Excitation of a two-mode limit cycle dynamics on the route to polarization switching in a VCSEL subject orthogonal to optical injection", I. Gatare, M. Sciamanna, M. Nizette, H. Thienpont, K. Panajotov, SPIE Photonics Europe 2008, 07-11 April 2008, Strasbourg, France.

COM-28. "Experimental study of transverse mode dynamics in vertical-cavity surface-emitting lasers under current modulation", A. Valle, M. Arizaleta Arteaga, K. Panajotov, M. Sciamanna, SPIE Photonics Europe 2008, 07-11 April 2008, Strasbourg, France.

COM-29. "Control of patterns formation in a single feedback system by photonic bandgap structures", N. Marsal, G. Montemezzani, D. Wolfersberger, M. Sciamanna, D. Neshev, SPIE Photonics Europe 2008, 07-11 April 2008, Strasbourg, France.

COM-30. "Self-pulsating and chaotic dynamics in VCSELs with orthogonal optical injection", M. Sciamanna, I. Gatare, K. Panajotov, ICO-21, 07-10 July 2008, Sydney, Australia.

COM-31. " Control of pattern formation in a single feedback system by photonic lattices", N. Marsal, G. Montemezzani, D. Wolfersberger, M. Sciamanna, D. Neshev, ICO-21, 07-10 July 2008, Sydney, Australia.

Conference Poster Contributions

P-1. "Numerical observation of in-phase and out-of-phase behaviors in the polarized modes of a vertical-cavity surface-emitting laser operating in the low-frequency fluctuations regime", M. Sciamanna, F. Rogister, P. Mégret, M. Blondel, IEEE/LEOS Benelux Chapter Annual Symposium 2000, Delft, The Netherlands, October 30, 2000.

P-2.. "Statistical study of the time between total power dropouts in a VCSEL operating in the low-frequency fluctuations regime", M. Sciamanna, F. Rogister, A. Locquet, P. Mégret, M. Blondel, CLEO/Pacific Rim 2001 conference, Chiba, Japan, 15-19 July 2001.

P-3. "Dynamical behavior of a multimode semiconductor laser subject to a single mode selective optical feedback", F. Rogister, M. Sciamanna, A. Locquet, O. Deparis, P. Mégret, M. Blondel, CLEO/Pacific Rim 2001 conference, Chiba, Japan, 15-19 July 2001.

P-4. "Bifurcation to polarization self-modulation in vertical-cavity surfaceemitting lasers", M. Sciamanna, T. Erneux, F. Rogister, O. Deparis, P. Mégret, M. Blondel, IEEE/LEOS Benelux Chapter Annual Symposium 2001, Brussels, Belgium, on the 3rd of December 2001.

P-5. "Different regimes of low-frequency fluctuations in vertical-cavity surface-emitting lasers", M. Sciamanna, C. Masoller, N.B. Abraham, F. Rogister, P. Mégret, M. Blondel, SPIE Photonics Fabrication Europe, Brugge, Belgium, 28 October - 1 November 2002.

P-6. "Polarization dynamics in VCSELs subject to optical injection", M. Sciamanna, K. Panajotov, G. Monticelli, A. Tabaka, H. Thienpont, I. Veretennicoff, P. Mégret, M. Blondel, S. Bandyopadhyay, Y. Hong, K.A. Shore, CLEO Europe/EQEC 2003, Munich, Germany, 23-27 June 2003.

P-7. "Bifurcation study of regular pulse packages in laser diodes subject to optical feedback", A. Tabaka, M. Sciamanna, I. Veretennicoff, K. Panajotov, CLEO Europe/EQEC 2003, Munich, Germany, 23-27 June 2003.

P-8. "Mapping of delayed dynamics in short external cavity", A. Tabaka, M. Sciamanna, I. Veretennicoff, K. Panajotov, IEEE/LEOS Annual Symposium of Benelux Chapter, Enschede, The Netherlands, 20-21 November 2003.

P-9. "Dynamique de polarisation dans un laser VCSEL soumis à injection optique", M. Sciamanna, K. Panajotov, I. Gatere, M. Triginer, H. Thienpont, Proceedings of Journées Nationales d'Optique Guidée (JNOG), 25-27 October 2004, Paris, France, pp 200-202 (2004).

P-10. "Experimental mapping of polarization dynamics induced by optical injection in VCSELs", M. Triginer, I. Gatere, H. Thienpont, M. Sciamanna, and K. Panajotov, IEEE/LEOS Benelux Chapter Annual Symposium 2004, 2-3 December 2004, Gent, Belgium.

P-11. "Experimental study of polarization switching and polarization mode hopping induced by optical injection in VCSELs", I. Gatere, M. Triginer, H. Thienpont, K. Panajotov, and M. Sciamanna, IEEE/LEOS Benelux Chapter Annual Symposium 2004, 2-3 December 2004, Gent, Belgium.

P-12. "Experimental studies of pulse packages in short external cavity VCSELs", A. Tabaka, M. Peil, M. Sciamanna, I. Fischer, W. Elsäßer, H. Thienpont, I. Veretennicoff, and K. Panajotov, IEEE/LEOS Benelux Chapter Annual Symposium 2004, 2-3 December 2004, Gent, Belgium.

P-13. " Synchronization of chaos in mutually coupled VCSELs: numerical study", K. Panajotov, A. Uchida, M. Sciamanna, CLEO/EQEC 2007, 17-22 June 2007, Munich, Germany.

P-14. "Mapping of transverse mode locking and switching in VCSELs under orthogonal optical injection", I. Gatare, A. Valle, K. Panajotov, M. Sciamanna, CLEO/EQEC 2007, 17-22 June 2007, Munich, Germany.

P-15. "Deterministic coherence resonance in chaotic lasers with time-delay", M. Sciamanna, S.H. Shams Mousavi, A. Bourouis, EOS Annual Meeting 2008, 29 September – 02 October 2008, Paris, France.

P-16. "Control of pattern formation in a single feedback system by photonic lattices", N. Marsal, D. Wolfersberger, M. Sciamanna, G. Montemezzani, D. N. Neshev, EOS Annual Meeting 2008, 29 September – 02 October 2008, Paris, France.

P-17. "Multiplexing Digital Information Using Hyperchaotic Optoelectronic Oscillators with Nonlinear Time-delayed Feedback Loops", D. Rontani, A. Locquet, M. Sciamanna, and D. Citrin, CLEO Europe 2009, 14-19 June 2009, Munich, Germany.

P-18. " Interface Solitons in Electro-Optically Configurable Waveguide Arrays", N. Marsal, I. Garanovich, T. Crasto, A. Mitchell, D. Wolfersberger, M. Sciamanna, G. Montemezzani, A. Sukhorukov, D. Neshev, Y. Kivshar, CLEO Europe 2009, 14-19 June 2009, Munich, Germany.

Invited talks

INV-1. "Optical Switching with VCSELs", M. Sciamanna, CLEO Europe 2005, 13-17 June 2005, Munich, Germany.

INV-2. "Polarization dynamics in VCSELs and bistable systems with delay", M. Sciamanna, ENOC 2005, 7-12 August 2005, Eindhoven, The Netherlands.

INV-3. "Nonlinear polarization dynamics of VCSELs with orthogonal optical injection", M. Sciamanna, Rio de la Plata Workshop on noise, chaos and complexity in lasers and nonlinear optics, 5-9 December 2005, Colonia del Sacramento, Uruguay.

INV-4. "Pulse package dynamics in VCSELs with delayed optical feedback from a short external cavity", M. Sciamanna, CHAOS'06, 28-30 juin 2006, Reims, France.

INV-5. "Bifurcation to Polarization Chaos in VCSELs with Orthogonal Optical Injection", M. Sciamanna, I. Gatare, K. Panajotov, NOLTA 2006, 11-14 septembre 2006, Bologna, Italy.

INV-6. "Polarization dynamics in externally-driven VCSELs", K. Panajotov, M. Sciamanna, ICONO/LAT 2007, Minsk (Belarus)

INV-7. "Vertical-Cavity Surface-Emitting Lasers: polarization properties, nonlinear dynamics, chaos synchronization", M. Sciamanna, IAP Photonics@be doctoral school, Cul-des-Sarts (Belgium)

INV-8. "Polarization synchronization properties of unidirectionally coupled VCSELs", M. Sciamanna, 9th International Conference on Transparent Optical Networks (ICTON 2007), Rome (Italie)

INV-9. "Dynamical diversity in VCSELs with optical injection", M. Sciamanna, Third Rio de la Plata Workshop, 3-7 December 2007, Punta del Este (Uruguay).

INV-10. "Chaotic polarization dynamics and chaos synchronization in VCSELs", M. Sciamanna, K. Panajotov, I. Gatare, H. Thienpont, A. Valle, M. Arizaleta, A. Uchida, plenary talk at IEEE/LEOS Winter Topicals 2009, 12-14 January 2009, Innsbruck (Austria).

INV-11. "Synchronization of chaos in mutually coupled Vertical-Cavity Surface-Emitting Lasers with time delay", A. Uchida, H. Someya, M. Ozaki, K. Tanaka, S. Yoshimori, K. Panajotov, M. Sciamanna, invited talk at IEEE/LEOS Winter Topicals 2009, 12-14 January 2009, Innsbruck (Austria).

INV-12. "Nonlinear control of light in periodic photonic structures: from waveguides to cavities", D. Neshev, N. Marsal, D. Wolfersberger, M. Sciamanna, G. Montemezzani, A. Sukhorukov, W. Krolikowski, Y. Kivshar, invited talk at IEEE/LEOS Winter Topicals 2009, 12-14 January 2009, Innsbruck (Austria).

INV-13. "Polarization dynamics in Vertical-Cavity Surface-Emitting Lasers subject to optical injection or current modulation", K. Panajotov, I. Gatare, M. Nizette, M. Sciamanna, H. Thienpont, A. Valle, invited talk at IEEE/LEOS Winter Topicals 2009, 12-14 January 2009, Innsbruck (Austria).

INV-14. "Polarization instabilities and nonlinear dynamics in a quantum dot laser", L. Olejniczak, M. Sciamanna, K. Panajotov, invited talk at ICTON 2009, 28 June-02 July 2009, Island of Sao Miguel, Azores (Portugal).