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José Miguel López-Higuera
Julian Jones
Manuel López-Amo
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Contents

Part One

- xliii *Conference Committees*
- xlvi *Introduction*
- li *Sponsor and Exhibitor Pages*
- liii *NanoPhotonics: pushing sensing to its limits in size and speed* (Plenary Abstract)
N. van Hulst, Institució Catalana de Recerca i Estudis Avançats, (Spain) and The Institute of Photonic Sciences (Spain)
- lv *Novel light-based technologies for biomedical applications* (Plenary Abstract)
S.-H. Yun, Harvard Medical School, Wellman Ctr. for Photomedicine, Harvard-MIT Health Sciences and Technology (United States)
- lvii *Quantum technologies for sensing, metrology and imaging* (Plenary Abstract)
J. P. Dowling, Hearne Institute for Theoretical Physics, Louisiana State Univ. (United States)
- lix *Three decades of optical fiber sensors commercialization: dawn, present, and future* (Invited Paper Abstract)
A. Mendez, MCH Engineering LLC (United States)
- lix *Nanoscale sensing using optical fibres: new photonic architectures and surface functionality enabling novel sensors* (Invited Paper Abstract)
T. Monro, The Univ. of Adelaide (Australia);
- lix *Direct laser writing in fiber: cladding photonics, optofluidic sensing, and smart catheters* (Invited Paper Abstract)
P. Hermann, Univ. of Toronto (Canada)

PHYSICAL, MECHANICAL, ELECTROMAGNETIC, INTERFEROMETRIC, AND POLARIMETRIC SENSORS INCLUDING GYROSCOPES I

- 9157 02 **Plasmonic hot spots: theoretical and practical limit for sensor applications** (Invited Paper) [9157-673]
B. Lee, K. Lee, T. Chung, J.-B. Park, S.-Y. Lee, H. Yun, Seoul National Univ. (Korea, Republic of)
- 9157 03 **Ferrule-top nano-mechanical resonator with multilayer graphene film** [9157-192]
J. Ma, W. Jin, H. Ho, C. Wang, The Hong Kong Polytechnic Univ., Shenzhen Research Institute (China) and The Hong Kong Polytechnic Univ. (Hong Kong, China)

- 9157 04 **Electric field sensing with high spatial resolution via a charged "flying particle" optically guided inside hollow-core PCF** [9157-195]
D. S. Bykov, O. A. Schmidt, T. G. Euser, Max Planck Institute for the Science of Light (Germany); P. St. J. Russell, Max Planck Institute for the Science of Light (Germany) and Univ. of Erlangen-Nuremberg (Germany)
- 9157 05 **Temperature compensation of fiber-optic current sensors** [9157-205]
G. M. Müller, L. Yang, B. Gülenaltin, A. Frank, K. Bohnert, ABB Ltd. (Switzerland)
- 9157 06 **Sensitive strain measurements with a fiber Bragg-grating ring resonator** [9157-577]
P. Malara, Istituto Nazionale di Ottica, CNR (Italy); C. E. Campanella, Politecnico di Bari (Italy); A. Giorgini, S. Avino, R. Zullo, G. Gagliardi, P. De Natale, Istituto Nazionale di Ottica, CNR (Italy)

PHYSICAL, MECHANICAL, ELECTROMAGNETIC, INTERFEROMETRIC, AND POLARIMETRIC SENSORS INCLUDING GYROSCOPES I

- 9157 07 **Optical fibre sensing in metals by embedment in 3D printed metallic structures (Invited Paper)** [9157-674]
R. R. J. Maier, D. Havermann, Heriot-Watt Univ. (United Kingdom); O. Schneller, Heriot-Watt Univ. (United Kingdom) and Munich Univ. of Applied Sciences (Germany); J. Mathew, D. Polyzos, W. N. MacPherson, D. P. Hand, Heriot-Watt Univ. (United Kingdom)
- 9157 08 **Tapered polarization-maintaining fiber sensor based on analysis of polarization evolution** [9157-558]
P. Lu, J. Song, G. Niedermayer, J. Harris, L. Chen, X. Bao, Univ. of Ottawa (Canada)
- 9157 09 **Wind tunnel unsteady pressure measurements using a differential optical fiber Fabry-Perot pressure sensor** [9157-569]
R. Correia, S. E. Staines, S. W. James, N. Lawson, K. Garry, R. P. Tatam, Cranfield Univ. (United Kingdom)
- 9157 0A **Multipoint two-dimensional curvature optical fibre sensor** [9157-493]
D. Barrera, S. Sales, Univ. Politècnica de València (Spain)
- 9157 0B **Performance of resonator fiber optic gyroscope using external-cavity laser stabilization and optical filtering** [9157-153]
T. Qiu, J. Wu, L. K. Strandjord, G. A. Sanders, Honeywell International (United States)

PHYSICAL, MECHANICAL, ELECTROMAGNETIC, INTERFEROMETRIC, AND POLARIMETRIC SENSORS INCLUDING GYROSCOPES III

- 9157 0D **In-line high-speed all-fiber polarimeter with true real-time acquisition for sensor systems based on fast polarization rotation** [9157-410]
V. Mikhailov, B. Rabin, P. S. Westbrook, OFS Labs. (United States)
- 9157 0E **Low noise and low drift in a laser-driven fiber optic gyroscope with a 1-km coil** [9157-616]
J. N. Chamoun, A. Evans, Stanford Univ. (United States); F. A. Mosca, iXBlue Sonar Systems Div. (France); M. J. F. Digonnet, Stanford Univ. (United States)

POSTER SESSION I

- 9157 0F **Species discrimination in plasma welding spectra by means of principal and independent component analysis** [9157-15]
E. Real, J. Mirapeix, O. M. Conde, R. Ruiz-Lombera, A. Cobo, J. M. Lopez-Higuera, Univ. de Cantabria (Spain)
- 9157 0G **Cavity ring-down with OTDR for remote sensing** [9157-40]
D. J. Passos, S. O. Silva, M. B. Marques, O. Frazão, INESC Porto (Portugal) and Univ. do Porto (Portugal)
- 9157 0H **Field demonstration of an eight-element fiber laser hydrophone array** [9157-44]
S. Foster, A. Tikhomirov, J. Harrison, J. van Velzen, Defence Science and Technology Organisation (Australia)
- 9157 0I **Fibre optical sensor for simultaneous measurement of pressure, temperature and refractive index** [9157-46]
R. D. Pechstedt, Oxsensis Ltd. (United Kingdom)
- 9157 0J **Novel FBG sensors based on cladding surface microstructures** [9157-51]
Y. Dai, M. Yang, J. M. Karanja, Q. Zhao, Wuhan Univ. of Technology (China)
- 9157 0K **Eliminating the influence of polarization instability using time-wavelet energy spectrum for FBG-FP static-strain sensing** [9157-70]
W. Huang, W. Zhang, Institute of Semiconductors (China); T. Zhen, F. Zhang, Shijiazhuang Tiedao Univ. (China); F. Li, Institute of Semiconductors (China)
- 9157 0L **π -phase-shifted FBG for improving static-strain measurement resolution based on triangle-wave laser tuning technique** [9157-71]
W. Huang, W. Zhang, Institute of Semiconductors (China); T. Zhen, C. Bian, Y. Du, Shijiazhuang Tiedao Univ. (China); F. Li, Institute of Semiconductors (China)
- 9157 0M **Distributed feedback fiber laser acoustic emission sensor for concrete structure health monitoring** [9157-73]
G. Hao, Institute of Semiconductors (China) and Shijiazhuang Tiedao Univ. (China); W. Huang, W. Zhang, Institute of Semiconductors (China); B. Sun, Shijiazhuang Tiedao Univ. (China); F. Li, Institute of Semiconductors (China)
- 9157 0N **Orientation-recognized rotation measurement using single polarimetric multi-mode tilted fiber grating** [9157-87]
F. Liu, T. Guo, L. Shang, Z. Zhang, F. Du, B.-O. Guan, Jinan Univ. (China); J. Albert, Carleton Univ. (China)
- 9157 0O **Polarization optical fiber sensor for distributed current monitoring** [9157-90]
L. Palmieri, Univ. degli Studi di Padova (Italy); D. Sarchi, Prysmian S.p.A. (Italy); A. Galtarossa, Univ. degli Studi di Padova (Italy) and Southeast Univ. (China)
- 9157 0P **Highly integrated FP/FBG sensor for simultaneous measurement of strain and temperature under high temperature** [9157-101]
Q. Liu, Z.-L. Ran, Y.-J. Rao, S.-C. Luo, H.-Q. Yang, Y. Huang, Univ. of Electronic Science and Technology of China (China)

- 9157 0Q **Highly sensitive current sensor based on an optical microfiber loop resonator incorporating low index polymer** [9157-130]
M. S. Yoon, Y.-G. Han, Hanyang Univ. (Korea, Republic of)
- 9157 0R **Temperature and pressure transducer based on FBG for large diameter water pipes** [9157-146]
A. Quintela, Univ. de Cantabria (Spain); M. J. Pallol, COPSESA S.A. (Spain); H. S. Roufael, Univ. de Cantabria (Spain); O. Martínez, J. D. San Emeterio, COPSESA S.A. (Spain); J. M. López-Higuera, Univ. de Cantabria (Spain)
- 9157 0S **Effect of a waist diameter of a polarization-maintaining fiber on ambient index sensitivity** [9157-149]
M.-S. Yoon, S. K. Kim, C.-J. Kang, Y.-G. Han, Hanyang Univ. (Korea, Republic of)
- 9157 0T **Hybrid Sagnac interferometer with high measurement resolution for simultaneous measurement of ambient index and temperature** [9157-150]
O.-J. Kwon, Y.-G. Han, Hanyang Univ. (Korea, Republic of)
- 9157 0U **Simultaneous measurement of temperature and static strain using FBG Fabry-Perot interferometer in polarization maintaining fiber** [9157-161]
R. Uchimura, A. Wada, S. Tekuramori, M. Takeuchi, O. Tukida, S. Tanaka, N. Takahashi, National Defense Academy (Japan)
- 9157 0V **Performance improvements in fiber-bending pressure sensors by using depressed cladding erbium doped fiber** [9157-174]
J. B. Rosolem, A. A. Leonardi, D. C. Dini, CPqD (Brazil)
- 9157 0W **Fiber optic dynamic electric field sensor based on nematic liquid crystal Fabry-Perot etalon** [9157-207]
M. O. Ko, S.-J. Kim, J.-H. Kim, M. Y. Jeon, Chungnam National Univ. (Korea, Republic of)
- 9157 0X **Fibers and sensors for monitoring nuclear power plants operation** [9157-210]
O. V. Butov, Y. K. Chamorovskii, K. M. Golant, Institute of Radio Engineering and Electronics (Russian Federation); I. A. Shevtsov, A. N. Fedorov, Prolog LLC (Russian Federation)
- 9157 0Y **Acoustic antenna based on fiber laser hydrophones** [9157-213]
F.-X. Launay, R. Bouffaron, R. Lardat, G. Roux, M. Doisy, C. Bergogne, Thales Underwater Systems (France)
- 9157 0Z **Fiber taper combined with magnetic fluid for magnetic field** [9157-217]
A. Layeghi, H. Latifi, Shahid Beheshti Univ. (Iran, Islamic Republic of); O. Frazão, INESC Porto (Portugal) and Univ. do Porto (Portugal)
- 9157 10 **Multiparameter measurement using a double-Y-shaped suspended-core fiber in a fiber loop configuration** [9157-232]
S. F. Silva, INESC Porto (Portugal); H. Baiert, XLIM Institut de Recherche, CNRS, Univ. de Limoges (France); J.-L. Auguste, R. Jamier, P. Roy, XLIM Institut de Recherche, CNRS, Univ. de Limoges (France); J. M. Baptista, INESC Porto (Portugal); J. L. Santos, O. Frazão, INESC Porto (Portugal) and Univ. do Porto (Portugal)

- 9157 11 **Fiber optic magnetic field sensor based on magnetic fluid and etched Hi-Bi fiber loop mirror** [9157-273]
J. Wang, C. Zhou, D. Fan, Y. Ou, Wuhan Univ. of Technology (China)
- 9157 12 **Strain and temperature sensing characteristics of asymmetric-twin-core PCF-based hybrid Mach-Zehnder interferometer** [9157-281]
K. Naeem, Gwangju Institute of Science and Technology (Korea, Republic of); B. Kim, Dankook Univ. (Korea, Republic of); Y. Chung, Gwangju Institute of Science and Technology (Korea, Republic of)
- 9157 13 **Comparison of FBG responses to static and dynamic pressures** [9157-282]
E. Shafir, S. Zilberman, A. Ravid, B. Glam, G. Appelbaum, A. Fedotov Gefen, Y. Saadi, N. Shafir, G. Berkovic, Soreq Nuclear Research Ctr. (Israel)
- 9157 14 **Opto-magnetostrictive current measurement instrument for high voltage environments** [9157-296]
F. V. B. de Nazaré, M. M. Werneck, Univ. Federal of Rio de Janeiro (Brazil)
- 9157 15 **Refractive index sensitivity of long-period fiber gratings written in thinned cladding fiber by CO₂ laser** [9157-311]
Y. Zhao, Y. Liu, Q. Guo, T. Wang, Shanghai Univ. (China)
- 9157 16 **Self-referenced temperature sensor based on a polymer optical fiber macro-bend** [9157-320]
A. Tapetado, P. J. Pinzón, Univ. Carlos III de Madrid (Spain); J. Zubia, Univ. del País Vasco (Spain); I. Pérez, C. Vázquez, Univ. Carlos III de Madrid (Spain)
- 9157 17 **A tactile sensing element based on a hetero-core optical fiber for force measurement and texture detection** [9157-322]
H. Yamazaki, Y. Koyama, K. Watanabe, Soka Univ. (Japan)
- 9157 18 **Interrogation of miniature extrinsic Fabry-Pérot sensor using path matched differential interferometer and phase generated carrier scheme** [9157-327]
F. Wang, J. Xie, Z. Hu, S. Xiong, H. Luo, Y. Hu, National Univ. of Defense Technology (China)
- 9157 19 **Long-term stable sapphire fiber Bragg grating sensors at 1400°C** [9157-329]
T. Habisreuther, T. Elsmann, Z. Pan, A. Graf, Institut für Photonische Technologien e.V. (Germany); P. Ahonen, K. Grujic, Teknova AS (Norway); S. Simonsen, H. Mathisen, R. Norheim, Elkem AS Technology (Norway); R. Willsch, M. Schmidt, Institut für Photonische Technologien e.V. (Germany)
- 9157 1A **Temperature characteristics of a high sensitive dual side hole fiber** [9157-330]
J. Sadeghi, H. Latifi, Shahid Beheshti Univ. (Iran, Islamic Republic of); M. Murawski, T. Nasiłowski, Military Univ. of Technology (Poland); P. Mergo, K. Poturaj, Maria Curie-Skłodowska Univ. (Poland); F. Mirkhosravi, Shahid Beheshti Univ. (Iran, Islamic Republic of)
- 9157 1B **Performance of chirped-FBG Fabry-Perot interferometer sensor in pulse-position modulation scheme: large-signal operation** [9157-359]
S. Tekuramori, M. Takeuchi, R. Uchimura, O. Tsukida, A. Wada, S. Tanaka, N. Takahashi, National Defense Academy (Japan)

- 9157 1C **Detection of an extremely small mass with a dual-polarization fiber grating laser** [9157-376]
Y. Liang, L. Jin, Q. Yuan, L. Cheng, B.-O. Guan, Jinan Univ. (China)
- 9157 1D **Simple fabrication method for point temperature sensor probes using erbium ytterbium-coated optical fibres** [9157-388]
E. P. Schartner, T. M. Monro, The Univ. of Adelaide (Australia)
- 9157 1E **Influence of quarter-wave retarder parameters on performance of fiber-optic current sensor** [9157-394]
S. M. Kostitskii, Yu. N. Korkishko, V. A. Fedorov, Optolink RPC (Russian Federation); V. P. Mitrokhin, Optolink RPC (Russian Federation) and Photochemistry Ctr. (Russian Federation)
- 9157 1F **Magnetic field sensor based on reflection spectrum measurement of fiber Bragg grating** [9157-400]
J. Yang, X. Dong, S. Jin, China Jiliang Univ. (China); C. C. Chan, P. P. Shum, Nanyang Technological Univ. (Singapore)
- 9157 1G **Characterization of Cerenkov radiation generated in silica and plastic optical fibers** [9157-411]
K. W. Jang, S. H. Shin, S. G. Kim, W. J. Yoo, Konkuk Univ. (Korea, Republic of); Y. H. Ji, Korea Institute of Radiological and Medical Sciences (Korea, Republic of); B. Lee, Konkuk Univ. (Korea, Republic of)
- 9157 1H **Highly sensitive operation of intensity-based fiber-optic vibration sensor using cascaded long period fiber grating** [9157-416]
S. Tanaka, O. Tsukida, M. Takeuchi, S. Tekuramori, R. Uchimura, A. Wada, N. Takahashi, National Defense Academy (Japan)
- 9157 1I **Study on the frequency response of static pressure compensated fiber laser hydrophone-theory and finite element simulation** [9157-433]
F. Zhang, X. Zhang, L. Wang, C. Wang, Laser Institute, Shandong Academy of Sciences (China)
- 9157 1J **Improved fibre optic acoustic sensors for partial discharge in elastomeric insulations** [9157-438]
P. Rohwetter, C. Lothongkam, W. Habel, Bundesanstalt für Materialforschung und -prüfung (Germany); G. Heidmann, IPH GmbH (Germany); D. Pepper, Beuth Hochschule für Technik Berlin (Germany)
- 9157 1K **Reflection-based phase-shifted long-period fiber grating for cryogenic temperature measurements** [9157-474]
R. Martins, INESC Porto (Portugal) and Instituto Politécnico de Viana do Castelo (Portugal); J. Monteiro, FiberSensing (Portugal); P. Caldas, INESC Porto (Portugal) and Instituto Politécnico de Viana do Castelo (Portugal); J. L. Santos, INESC Porto (Portugal) and Univ. do Porto (Portugal); G. Rego, INESC Porto (Portugal) and Instituto Politécnico de Viana do Castelo (Portugal)

- 9157 1L **Measurements of laser-induced thermoelastic deformation using all-fiber heterodyne interferometer** [9157-491]
S. J. Park, J. H. Eom, Gwangju Institute of Science and Technology (Korea, Republic of); C. S. Lee, Univ. of Suwon (Korea, Republic of); B. H. Lee, Gwangju Institute of Science and Technology (Korea, Republic of)
- 9157 1M **Evaluation of the optical switching characteristics of erbium-doped fibres for the development of a fibre Bragg grating sensor interrogator** [9157-548]
E. Rigas, Technical Education Institute of Piraeus (Greece); R. Correia, Cranfield Univ. (United Kingdom); N. A. Stathopoulos, S. P. Savaidis, Technical Education Institute of Piraeus (Greece); S. W. James, D. Bhattacharyya, P. B. Kirby, R. P. Tatam, Cranfield Univ. (United Kingdom)
- 9157 1N **Temperature and mechanical reliability of electrolytic fiber to metal joints for applications in fiber optic sensor** [9157-549]
T. Stanczyk, K. Wysokinski, InPhoTech Ltd. (Poland); T. Tenderenda, S. Lipinski, L. Ostrowski, InPhoTech Ltd. (Poland) and Military Univ. of Technology (Poland); M. Broczkowska, Military Univ. of Technology (Poland) and Polish Ctr. for Photonics and Fiber Optics (Poland); A. Ziolkowicz, InPhoTech Ltd. (Poland) and Military Univ. of Technology (Poland); K. Gibala, Rzeszow Univ. of Technology (Poland) and P.H. ELMAT Sp. z o.o. (Poland); H. Krisch, B. Niemann, KROHNE Messtechnik GmbH & Co. KG (Germany); L. R. Jaroszewicz, Military Univ. of Technology (Poland); T. Nasilowski, InPhoTech Ltd. (Poland) and Military Univ. of Technology (Poland)
- 9157 1O **Transverse strain response of in-fibre Fabry-Perot microcavities** [9157-556]
M. Manders, M. Partridge, R. N. Correia, S. W. James, R. P. Tatam, Cranfield Univ. (United Kingdom)
- 9157 1P **New silica microspheres array sensor** [9157-560]
M. S. Ferreira, J. L. Santos, O. Frazão, INESC Porto (Portugal) and Univ. do Porto (Portugal)
- 9157 1Q **Optical strain sensor based on FPI micro-cavities produced by the fiber fuse effect** [9157-581]
M. F. Domingues, P. Antunes, N. Alberto, R. Frias, R. S. Ferreira, Univ. de Aveiro (Portugal); P. André, Univ. de Lisboa (Portugal)
- 9157 1R **All-fiber sensor based on a metallic coated hybrid LPG-FBG structure for thermal characterization of materials** [9157-588]
G. E. Silva, Univ. de São Paulo (Brazil); P. Caldas, INESC Porto (Portugal) and Instituto Politécnico de Viana do Castelo (Portugal); J. C. Santos, Univ. de São Paulo (Brazil); J. L. Santos, INESC Porto (Portugal) and Univ. do Porto (Portugal)
- 9157 1S **Optical fiber refractive index sensor with reduced thermal sensitivity based on Superimposed Long-Period Gratings** [9157-594]
G. E. Silva, Univ. de São Paulo (Brazil); P. Caldas, INESC Porto (Portugal) and Instituto Politécnico de Viana do Castelo (Portugal); J. C. Santos, Univ. de São Paulo (Brazil); J. L. Santos, INESC Porto (Portugal) and Univ. do Porto (Portugal)
- 9157 1T **Longitudinal spatial characterisation of optical fibre erbium distributed feedback laser under the motion of steady magnetic field** [9157-606]
Y. Yao, Central China Normal Univ. (China) and Univ. of Strathclyde (United Kingdom); G. M. H. Flockhart, Univ. of Strathclyde (United Kingdom)

- 9157 1U **Fabry-Perot cavity hydrostatic pressure sensors** [9157-620]
L. Carvalho, P. Roriz, Univ. de Aveiro (Portugal) and INESC Porto (Portugal); J. Simões, Univ. de Aveiro (Portugal); J. L. Santos, O. Frazão, INESC Porto (Portugal)
- 9157 1V **Suppression of polarization instability in optical pulse correlation remote sensing** [9157-626]
M. Lu, H. Kobayashi, K. Nonaka, Kochi Univ. of Technology (Japan)
- 9157 1W **High sensitivity side-polished multimode fiber based refractometer** [9157-630]
H. Gan, H. Gan, J. Zhang, Z. Chen, J. Tang, Y. Luo, J. Yu, Z. Zang, H. Lu, Jinan Univ. (China)
- 9157 1X **Sensing with metallic nanowires** [9157-649]
P. Fernandes, IFIMUP and Institute of Nanoscience and Nanotechnology (Portugal); I. T. Leite, INESC TEC (Portugal); J. M. Teixeira, IFIMUP and Institute of Nanoscience and Nanotechnology (Portugal); A. Hierro-Rodríguez, IFIMUP and Institute of Nanoscience and Nanotechnology (Portugal) and INESC TEC (Portugal); J. P. Araújo, IFIMUP and Institute of Nanoscience and Nanotechnology (Portugal); A. Guerreiro, INESC TEC (Portugal) and Univ. do Porto (Portugal)
- 9157 1Y **Control of the strain sensitivity using a suspended core photonic crystal fiber sensing head** [9157-27]
S. Rota-Rodrigo, M. Lopez-Amo, Univ. Pública de Navarra (Spain); J. Kobelke, K. Schuster, Institut für Photonische Technologien e.V. (Germany); J. L. Santos, O. Frazão, INESC Porto (Portugal) and Univ. do Porto (Portugal)
- 9157 1Z **Temperature-insensitive Sagnac-type optical current transformer** [9157-139]
K. Sasaki, M. Takahashi, Y. Hirata, Toshiba Corp. (Japan)
- 9157 20 **V-groove all-fiber intermodal Mach-Zehnder interferometer and its high-temperature sensing application** [9157-159]
Z. Yin, Y. Geng, X. Li, X. Tan, R. Gao, Shenzhen Univ. (China)
- 9157 21 **Simultaneous strain and temperature measure based on a single suspended core photonic crystal fiber** [9157-199]
S. Rota-Rodrigo, M. Lopez-Amo, Univ. Pública de Navarra (Spain); J. Kobelke, K. Schuster, Institut für Photonische Technologien e.V. (Germany); J. L. Santos, O. Frazão, INESC Porto (Portugal) and Univ. do Porto (Portugal)
- 9157 22 **Multiplexed EFPI sensors with ultra-high resolution** [9157-252]
N. Ushakov, L. Liokumovich, St. Petersburg State Polytechnical Univ. (Russian Federation)
- 9157 23 **Fabrication and characterization of spun HiBi PCF fibers for current sensing applications** [9157-266]
I. M. Nascimento, INESC Porto (Portugal) and Univ. do Porto (Portugal); G. Chesini, Univ. Estadual de Campinas (Brazil); A. C. S. Brígida, INESC Porto (Brazil) and Univ. Federal do Pará (Brazil); J. G. Hayashi, Univ. Estadual de Campinas (Brazil); J. M. Baptista, INESC Porto (Portugal) and Univ. da Madeira (Portugal); J. C. W. A. Costa, Univ. Federal do Pará (Brazil); M. A. G. Martinez, Ctr. Federal de Educação Tecnológica Celso Suckow da Fonseca (Brazil); P. A. S. Jorge, INESC Porto (Portugal); C. M. B. Cordeiro, Univ. Estadual de Campinas (Brazil)

- 9157 24 **Giant-area fiber-optic gyroscope with Raman-based temperature sensing for metrological applications** [9157-332]
G. Bolognini, Istituto per la Microelettronica e Microsistemi, CNR (Italy); C. Clivati, Istituto Nazionale di Ricerca Metrologica (Italy); G. Costanzo, Politecnico di Torino (Italy); M. Frittelli, F. Levi, A. Mura, Istituto Nazionale di Ricerca Metrologica (Italy); S. Schiller, Heinrich-Heine-Univ. Düsseldorf (Germany); D. Calonico, Istituto Nazionale di Ricerca Metrologica (Italy)
- 9157 25 **Temperature-insensitive strain sensor based on in-line Fabry-Perot interferometer** [9157-368]
Y. Wang, S. Liu, C. Liao, Z. Li, Q. Wang, G. Yin, J. He, B. Sun, J. Zhao, J. Tang, Shenzhen Univ. (China)
- 9157 26 **An all optical fiber frequency reference using digital interferometry** [9157-387]
M. B. Gray, T. G. McRae, National Measurement Institute of Australia (Australia); S. Ngo, D. A. Shaddock, The Australian National Univ. (Australia); M. T. L. Hsu, National Measurement Institute of Australia (Australia)
- 9157 27 **Sensitivity enhancement of Faraday effect based heterodyning fiber laser magnetic field sensor with the assistance of CO₂-laser treatment** [9157-390]
L. Cheng, J. Han, L. Jin, Z. Guo, B.-O. Guan, Jinan Univ. (China)
- 9157 28 **Temperature sensor with enhanced sensitivity by cascaded fiber optic Sagnac loops** [9157-454]
L.-Y. Shao, Y. Luo, Z. Zhang, X. Zou, B. Luo, W. Pan, L. Yan, Southwest Jiaotong Univ. (China)
- 9157 29 **Refractive index insensitive temperature sensor based on hollow annular core fiber Mach-Zehnder interferometer** [9157-477]
Y. Zhang, A. Zhou, Q. Xu, B. Qin, Z. Liu, Harbin Engineering Univ. (China)
- 9157 2A **Ultra-high sensitive temperature sensor based on multimode fiber Mach-Zehnder interferometer** [9157-479]
A. Zhou, Y. Zhang, Y. Yang, J. Yang, Z. Liu, Harbin Engineering Univ. (China)
- 9157 2B **Polarimetric DBR fiber laser sensor for strain-temperature discrimination** [9157-496]
L. Rodriguez-Cobo, M. A. Quintela, I. Laarossi, J. M. Lopez-Higuera, Univ. de Cantabria (Spain)
- 9157 2C **In-line Mach-Zehnder interferometer based on a dissimilar-doping dual-core fiber for high sensitivity strain and temperature sensing** [9157-500]
H. F. Martins, INESC Porto (Portugal) and Univ. do Porto (Portugal); J. Bierlich, K. Wondraczek, S. Unger, J. Kobelke, K. Schuster, Institut für Photonische Technologien e.V. (Germany); M. B. Marques, INESC Porto (Portugal) and Univ. do Porto (Portugal); M. Gonzalez-Herraez, Univ. de Alcalá (Spain); O. Frazão, INESC Porto (Portugal) and Univ. do Porto (Portugal)
- 9157 2D **Interferometric filtering of the excess relative intensity noise of the broadband source of a fiber optic gyroscope** [9157-521]
J. Honthaas, J.-J. Bonnefois, E. Ducloux, H. Lefèvre, iXBlue (France)

- 9157 2E **Influence of spin manufacturing process on properties of the spun single mode fiber** [9157-534]
J. X. Wen, Shanghai Univ. (China); Y. P. Wen, Shanghai Hengtong Photoelectric Technology Co., Ltd. (China); J. Wang, W. J. Liu, Z. Y. Chen, T. Y. Wang, Shanghai Univ. (China); Y. H. Luo, The Univ. of New South Wales (China); G. D. Peng, The Univ. of New South Wales (Australia)
- 9157 2F **Open cavity Fabry-Pérot interferometric refractometer based on C-shaped fiber** [9157-535]
C. Wu, The Hong Kong Polytechnic Univ. (Hong Kong, China) and Jinan Univ. (China); Z. Liu, A. P. Zhang, The Hong Kong Polytechnic Univ. (Hong Kong, China); B.-O. Guan, Jinan Univ. (China); H.-Y. Tam, The Hong Kong Polytechnic Univ. (Hong Kong, China)
- 9157 2G **Optical fiber sensor of partial discharges in High Voltage DC experiments** [9157-579]
I. Búa-Núñez, Univ. Carlos III de Madrid (Spain); C. G. Azcárraga-Ramos, Univ. di Bologna (Italy); J. E. Posada-Román, J. A. Garcia-Souto, Univ. Carlos III de Madrid (Spain)
- 9157 2H **Thermal strain along optical fiber in lightweight composite FOG: Brillouin-based distributed measurement and finite element analysis** [9157-625]
S. Minakuchi, T. Sanada, N. Takeda, The Univ. of Tokyo (Japan); S. Mitani, T. Mizutani, Y. Sasaki, K. Shinozaki, Japan Aerospace Exploration Agency (Japan)
- 9157 2I **Speckle POF sensor for detecting vital signs of patients** [9157-642]
M. Lomer, L. Rodriguez-Cobo, P. Revilla, G. Herrero, F. Madruga, J. M. Lopez-Higuera, Univ. de Cantabria (Spain)
- 9157 2J **Stress-based mechanisms in polymer mPOFs for fibre optic sensing** [9157-667]
G. Durana, O. Arizabalaga, G. Aldabaldeireku, M. A. Illarramendi, J. Zubia, Univ. of the Basque Country (Spain)
- 9157 2K **Ultra-short DBR fiber laser based sensor for arterial pulse monitoring** [9157-636]
Q. Sun, J. Wo, H. Wang, D. Liu, Huazhong Univ. of Science and Technology (China)
- 9157 2L **Fabrication of long period fiber gratings based on embedded-core hollow optical fiber** [9157-209]
C. Guan, X. Zhong, Harbin Engineering Univ. (China); X. Tian, PetroChina Co. (China) and Harbin Engineering Univ. (China); S. Li, L. Yuan, Harbin Engineering Univ. (China)
- 9157 2M **Polarization characteristics of graphene-coated surface core fiber** [9157-222]
S. Li, C. Guan, X. Zhong, Y. Shen, L. Yuan, Harbin Engineering Univ. (China)
- 9157 2N **Advanced fabrication and calibration of high-temperature sensor elements based on sapphire fiber Bragg gratings** [9157-254]
T. Elsmann, T. Habisreuther, M. Rothhardt, R. Willsch, H. Bartelt, Institut für Photonische Technologien e.V. (Germany)
- 9157 2O **Novel sensing concept based on optical Tamm plasmon** [9157-256]
W. L. Zhang, F. Wang, Y. Rao, J. Yao, Univ. of Electronic Science and Technology of China (China)
- 9157 2P **Displacement measurement based on cross-phase modulation of orthogonally polarized sinusoidal optical signals** [9157-262]
C. Baker, X. Bao, Univ. of Ottawa (Canada)

- 9157 2Q **Short cavity active mode locking fiber laser for optical sensing and imaging** [9157-283]
H. D. Lee, G. H. Han, S. W. Jeong, M. Y. Jeong, C.-S. Kim, Pusan National Univ. (Korea, Republic of); J. G. Shin, B. H. Lee, T. J. Eom, Gwangju Institute of Science and Technology (Korea, Republic of)
- 9157 2R **Microstructured fibres ultraviolet sources for sensing applications** [9157-289]
Z. Holdynski, M. Napierala, M. Szymanski, M. Murawski, Military Univ. of Technology (Poland) and InPhoTech Ltd. (Poland); P. Mergo, Maria Curie-Sklodowska Univ. (Poland); P. Marc, L. R. Jaroszewicz, Military Univ. of Technology (Poland); T. Nasilowski, Military Univ. of Technology (Poland) and InPhoTech Ltd. (Poland)
- 9157 2S **Regeneration of tilted fiber Bragg gratings** [9157-310]
R. Cotillard, G. Laffont, P. Ferdinand, Lab. de Mesures Optiques, LIST, CEA (France)
- 9157 2T **First order fiber Bragg grating inscription with femtosecond laser and reflection wavelengths from visible to infrared** [9157-314]
M. Becker, T. Elsmann, A. Schwuchow, M. Rothhardt, S. Dochow, H. Bartelt, Institut für Photonische Technologien e.V. (Germany)
- 9157 2U **Ultrahigh resolution optical spectrometry based on Brillouin dynamic grating** [9157-360]
Y. Dong, T. Jiang, L. Teng, Harbin Institute of Technology (China); H. Zhang, Harbin Univ. of Science and Technology (China); L. Chen, X. Bao, Univ. of Ottawa (Canada); Z. Lu, Harbin Institute of Technology (China)
- 9157 2V **Strain sensitivity enhancement for FBG sensors by all-optical frequency chirp magnification with high-order cascaded FWM** [9157-408]
J. Du, X. Fan, Q. Liu, Z. He, Shanghai Jiao Tong Univ. (China)
- 9157 2W **Highly stable single-wavelength and broadband random fiber lasers** [9157-418]
W. L. Zhang, S. W. Li, Y. J. Rao, Y. Y. Zhu, Z. N. Wang, J. Li, Univ. of Electronic Science and Technology of China (China)
- 9157 2X **High-sensitivity fiber optic accelerometer based on multilayer fiber coils** [9157-422]
F. Peng, J. Yang, F. Gao, Harbin Engineering Univ. (China)
- 9157 2Y **Supercontinuum generation in nonlinear fibers using high-energy figure-of-eight mode-locked fiber laser for SD-OCT application** [9157-456]
B. Xu, T. Nagata, S. Yamashita, The Univ. of Tokyo (Japan)
- 9157 2Z **Optical power supply unit utilizing high power laser diode module developed for fiber laser pumping** [9157-502]
A. Sakamoto, W. Kiyoyama, R. Yamauchi, Fujikura Ltd. (Japan)
- 9157 30 **Al-doped optical fiber to enhance strain sensitivity of Brillouin based optical fiber sensors** [9157-480]
Y. Sikali Mamdem, EDF Recherche & Développement (France); F. Taillade, EDF Recherche & Développement (France) and Univ. Paris Est (France); Y. Jaouën, R. Gabet, Télécom ParisTech (France); G. Moreau, EDF Recherche & Développement (France); A. Faustov, SCK CEN (Belgium); G. Pilorget, S. Delepine-Lesoille, ANDRA (France)
- 9157 31 **Temperature characterisation of an optically interrogated Rogowski coil** [9157-481]
G. Fusiek, P. Orr, P. Niewczas, Univ. of Strathclyde (United Kingdom)

- 9157 32 **Multi-core to 7 single-core-fibers fan-out device with multi-core fiber pigtail connector** [9157-501]
K. Omichi, H. Uemura, K. Sasaki, K. Takenaga, R. Goto, S. Matsuo, Fujikura Ltd. (Japan); K. Saitoh, Hokkaido Univ. (Japan); R. Yamauchi, Fujikura Ltd. (Japan)
- 9157 33 **Single-polarization microfiber and resonator for sensing applications** [9157-520]
F. Xu, J.-H. Chen, Y. Lu, Nanjing Univ. (China)
- 9157 34 **A sub-micron plasmonic nano-resonator refractometer in metal-coated fiber taper** [9157-530]
M. Ding, BeiHang Univ. (China) and Univ. of Southampton (United Kingdom); M. N. Zervas, Univ. of Southampton (United Kingdom); W. Quan, BeiHang Univ. (China); G. Brambilla, Univ. of Southampton (United Kingdom)
- 9157 35 **Six microelectrodes assembly for tunable optical fibers** [9157-543]
S. Ertman, T. R. Woliński, Warsaw Univ. of Technology (Poland)
- 9157 36 **Pulse-compression optical time domain reflectometer** [9157-566]
S. Yang, W. Zou, X. Long, J. Chen, Shanghai Jiao Tong Univ. (China)
- 9157 37 **Performance of digital incoherent OFDR and prospects for optical fiber sensing applications** [9157-575]
S. Liehr, Bundesanstalt für Materialforschung und -prüfung (Germany); N. Nöther, fibrisTerre GmbH (Germany); M. Steffen, Bundesanstalt für Materialforschung und -prüfung (Germany); O. Gili, fibrisTerre GmbH (Germany); K. Krebber, Bundesanstalt für Materialforschung und -prüfung (Germany)
- 9157 38 **Theoretical modeling of a Localized Surface Plasmon Resonance (LSPR) based fiber optic temperature sensor** [9157-590]
J. F. Algorri, B. García-Cámara, Univ. Carlos III de Madrid (Spain); A. García-García, Ciudad Univ. (Spain); V. Urruchi, J. M. Sánchez-Pena, Univ. Carlos III de Madrid (Spain)
- 9157 39 **Optical fiber elements for addressing individual cores in multicore optical fiber sensors** [9157-602]
M. Napierala, M. Murawski, M. Szymanski, L. Ostrowski, Military Univ. of Technology (Poland) and InPhoTech Ltd. (Poland); L. Szostkiewicz, InPhoTech Ltd. (Poland); P. Mergo, Maria Curie-Skłodowska Univ. (Poland); L. Jaroszewicz, Military Univ. of Technology (Poland); T. Nasilowski, Military Univ. of Technology (Poland) and InPhoTech Ltd. (Poland)
- 9157 3A **Evaluation of a 1540nm VCSEL for fibre Bragg gratings interrogation in dynamic measurement applications** [9157-628]
J. A. Garcia-Souto, P. Martin-Mateos, J. E. Posada, P. Acedo, Univ. Carlos III de Madrid (Spain); D. A. Jackson, Univ. Carlos III de Madrid (Spain) and Univ. of Kent (United Kingdom)
- 9157 3B **Remote sensing with nonlinear negative-index metamaterials** [9157-634]
A. K. Popov, Univ. of Wisconsin-Stevens Point (United States) and Birck Nanotechnology Ctr., Purdue Univ. (United States); S. A. Myslivets, L.V. Kirensky Institute of Physics (Russian Federation)

- 9157 3C **Analysis of a fibre optic sensor design based on SPR in nanowire metamaterial films** [9157-650]
I. T. Leite, INESC TEC (Portugal); P. Fernandes, IFIMUP and Institute of Nanoscience and Nanotechnology (Portugal); A. Hierro-Rodriguez, INESC TEC (Portugal) and IFIMUP and Institute of Nanoscience and Nanotechnology (Portugal); J. M. Teixeira, IFIMUP and Institute of Nanoscience and Nanotechnology (Portugal); P. S. Jorge, INESC TEC (Portugal); A. Guerreiro, INESC TEC (Portugal) and Univ. do Porto (Portugal)
- 9157 3D **Analysis of the spectrum distortions of optical fiber Bragg gratings fabricated in-line on a draw tower by the phase mask technique** [9157-657]
Y. Zheng, H. Yu, H. Guo, X. Li, D. Jiang, Wuhan Univ. of Technology (China)
- 9157 3E **Generation of fiber-based plasmonic Airy beam** [9157-208]
C. Guan, Harbin Engineering Univ. (China) and Univ. of Southampton (United Kingdom); M. Ding, J. Shi, Univ. of Southampton (United Kingdom); P. Wang, Harbin Engineering Univ. (China) and Dublin Institute of Technology (Ireland); P. Hua, G. Brambilla, Univ. of Southampton (United Kingdom); L. Yuan, Harbin Engineering Univ. (China)
- 9157 3F **Design of long period fiber grating with optimal sensitivity for detecting adhesion of nano-layer on the fiber surface** [9157-614]
P. Biswas, T. K. Dey, N. Basumallick, P. K. Sinha, K. Dasgupta, S. Bandyopadhyay, Central Glass and Ceramic Research Institute (India)
- 9157 3G **Hydrostatic pressure sensitivity of standard polymer fibre Bragg gratings and etched polymer fibre Bragg gratings** [9157-125]
K. Bhowmik, The Univ. of New South Wales (Australia) and National ICT Australia (Australia); G. Rajan, The Univ. of New South Wales (Australia); E. Ambikairajah, The Univ. of New South Wales (Australia) and National ICT Australia (Australia); G.-D. Peng, The Univ. of New South Wales (Australia)

CHEMICAL, ENVIRONMENTAL, BIOLOGICAL, MEDICAL SENSORS AND BIOPHOTONICS I

- 9157 3H **Exploring the dark continent with fibre Bragg gratings** [9157-212]
J. W. Arkwright, D. H.-C. Wang, S. A. Maunder, N. G. Blenman, Commonwealth Scientific and Industrial Research Organisation (Australia); I. Underhill, Griffith Univ. (Australia); V. Patton, The Univ. of New South Wales (Australia); P. G. Dinning, Flinders Univ. (Australia)
- 9157 3I **Microfluidic device integrated with FBG in Co²⁺-doped fiber to measure flow rate with nL/s sensitivity** [9157-278]
Z. Liu, A. Zhang, H. Tam, The Hong Kong Polytechnic Univ. (Hong Kong, China)
- 9157 3J **Celiac disease biodetection using lossy-mode resonances generated in tapered single-mode optical fibers** [9157-286]
A. B. Socorro, J. M. Corres, I. Del Villar, I. R. Matias, F. J. Arregui, Univ. Pública de Navarra (Spain)
- 9157 3K **Fiber optical beam shaping using polymeric structures** [9157-356]
R. S. Rodrigues Ribeiro, INESC TEC (Portugal) and Univ. do Porto (Portugal); R. B. Queirós, INESC TEC (Portugal); A. Guerreiro, INESC TEC (Portugal) and Univ. do Porto (Portugal); C. Ecoffet, O. Soppera, Institut de Sciences des Matériaux de Mulhouse, CNRS (France); P. S. Jorge, INESC TEC (Portugal)

Part Two

CHEMICAL, ENVIRONMENTAL, BIOLOGICAL, MEDICAL SENSORS AND BIOPHOTONICS II

- 9157 3L **Wide and fast wavelength-swept fiber lasers based on dispersion tuning for real-time OCT (Invited Paper)** [9157-676]
S. Yamashita, Y. Takubo, The Univ. of Tokyo (Japan)
- 9157 3M **High-sensitivity humidity sensors based on TiO₂-coated long period fiber grating for high-energy physics applications** [9157-506]
G. Berruti, Univ. degli Studi del Sannio (Italy) and CERN (Switzerland); M. Consales, Univ. degli Studi del Sannio (Italy); A. Borriello, M. Giordano, Istituto per i Materiali Compositi e Biomedici, CNR (Italy); S. Buontempo, INFN, CNR (Italy); G. Breglio, Univ. degli Studi di Napoli Federico II (Italy); A. Makovec, The Univ. of Debrecen (Hungary); P. Petagna, CERN (Switzerland); A. Cusano, Univ. degli Studi del Sannio (Italy)
- 9157 3N **Photochemistry on soft-glass hollow-core photonic crystal fibre** [9157-527]
A. M. Cubillas, Max-Planck-Institut für die Physik des Lichts (Germany) and Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); X. Jiang, T. G. Euser, Max-Planck-Institut für die Physik des Lichts (Germany); N. Taccardi, B. J. M. Etzold, P. Wasserscheid, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); P. St. J. Russell, Max-Planck-Institut für die Physik des Lichts (Germany) and Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany)
- 9157 3O **Fiber optic sensing system for monitoring of coal waste piles in combustion** [9157-576]
D. Viveiros, INESC Porto (Portugal); J. Ribeiro, Univ. do Porto (Portugal); J. P. Carvalho, J. Ferreira, INESC Porto (Portugal); A. R. Pinto, R. A. Perez-Herrera, S. Diaz, Univ. Pública de Navarra (Spain); A. Lopez-Gil, A. Dominguez-Lopez, O. Esteban, H. F. Martins, S. Martin-Lopez, Univ. de Alcalá (Spain); H. Baierl, J.-L. Auguste, R. Jamier, S. Rougier, XLIM Institut de Recherche, CNRS, Univ. de Limoges (France); J. L. Santos, INESC Porto (Portugal) and Univ. do Porto (Portugal); D. Flores, Univ. do Porto (Portugal); P. Roy, XLIM Institut de Recherche, CNRS, Univ. de Limoges (France); M. González-Herráez, Univ. de Alcalá (Spain); M. López-Amo, Univ. Pública de Navarra (Spain); J. M. Baptista, INESC Porto (Portugal) and Univ. da Madeira (Portugal)
- 9157 3P **High sensitivity methane and ethane detection using low-loss mid-IR hollow-core photonic bandgap fibers** [9157-37]
M. N. Petrovich, A. M. Heidt, N. V. Wheeler, N. K. Baddela, D. J. Richardson, Univ. of Southampton (United Kingdom)

DISTRIBUTED SENSING I

- 9157 3Q **The intelligent distributed acoustic sensing (Invited Paper)** [9157-677]
T. R. Parker, A. Gillies, S. V. Shatalin, M. Farhadiroushan, Silixa Ltd. (United Kingdom)
- 9157 3R **MilliKelvin resolution in cryogenic temperature distributed fibre sensing based on coherent Rayleigh scattering** [9157-592]
X. Lu, M. A. Soto, L. Thévenaz, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

- 9157 3S **Distributed measurement of intermodal beat length in an elliptic-core two-mode fiber by Brillouin dynamic grating** [9157-404]
Y. H. Kim, K. Y. Song, Chung-Ang Univ. (Korea, Republic of)
- 9157 3T **Distributed optical fibre audible frequency sensor** [9157-93]
A. Masoudi, M. Belal, T. P. Newson, Univ. of Southampton (United Kingdom)
- 9157 3U **Simple method for the elimination of polarization noise in BOTDA using balanced detection of orthogonally polarized Stokes and anti-Stokes probe sidebands** [9157-470]
A. López-Gil, A. Domínguez-López, S. Martín-López, M. González-Herráez, Univ. de Alcalá (Spain)

DISTRIBUTED SENSING II

- 9157 3V **Distributed strain and temperature sensing based on Brillouin scattering in plastic optical fibers (Invited Paper)** [9157-678]
Y. Mizuno, N. Hayashi, K. Nakamura, Tokyo Institute of Technology (Japan)
- 9157 3W **Discriminative and distributed measurement of temperature and strain with time-division pump-probe-read light generation by single laser diode in simplified BOCDA system** [9157-499]
T. Matsumoto, M. Kishi, K. Hotate, The Univ. of Tokyo (Japan)
- 9157 3X **Bragg gratings in carbon coated optical fibers and their potential sensor applications in harsh environment** [9157-605]
Y. Li, D. J. Kudelko, A. S. Hokansson, D. A. Simoff, A. A. Stolor, J. Ng, J. Mann, OFS Fitel LLC (United States)

POSTER SESSION II

- 9157 3Y **Anomalous refractive index of ultrathin gold nanoparticle film coated on tilted fiber Bragg grating** [9157-7]
W. Zhou, D. J. Mandia, M. B. E. Griffiths, S. T. Barry, J. Albert, Carleton Univ. (Canada)
- 9157 3Z **Ex vivo determination of chewing patterns using FBG and artificial neural networks** [9157-41]
L. Z. Karam, V. Pegorini, Univ. Tecnológica Federal do Paraná (Brazil); C. S. R. Pitta, Instituto Técnica Federal do Paraná (Brazil); T. S. Assmann, R. Cardoso, H. J. Kalinowski, J. C. C. Silva, Univ. Tecnológica Federal do Paraná (Brazil)
- 9157 40 **Fiber optic dual EFPI/FBG for radiofrequency ablation monitoring in liver: ex-vivo experiments** [9157-45]
D. Tosi, Univ. of Limerick (Ireland); E. G. Macchi, G. Braschi, M. Gallati, Univ. degli Studi di Pavia (Italy); A. Cigada, Politecnico di Milano (Italy); S. Rossi, IRCCS Policlinico San Matteo Foundation (Italy); S. Poeggel, G. Leen, E. Lewis, Univ. of Limerick (Ireland)

- 9157 41 **Fiber optic extrinsic Fabry-Perot interferometry pressure sensors for *in-vivo* urodynamic analysis** [9157-67]
S. Poeggel, D. Tosi, Univ. of Limerick (Ireland); F. Fusco, V. Mirone, S. Sannino, L. Lupoli, J. Ippolito, Univ. degli Studi di Napoli Federico II (Italy); G. Leen, E. Lewis, Univ. of Limerick (Ireland)
- 9157 42 **Biofunctionalized microfiber Bragg grating for acid-based sensing** [9157-69]
Y. Ran, Y. Huang, X. Shen, D. Sun, X. Wang, L. Jin, J. Li, B. Guan, Jinan Univ. (China)
- 9157 43 **Optimization and characterization of femtosecond laser inscribed in-fiber microchannels for liquid sensing** [9157-76]
G. C. B. Lee, C. Mou, K. Zhou, K. Sugden, Aston Univ. (United Kingdom)
- 9157 44 **A novel liquid viscosity measuring approach based on optical trapping technology** [9157-77]
Y. Zhang, P. Liang, Z. Liu, J. Lei, E. Zhao, J. Yang, L. Yuan, Harbin Engineering Univ. (China)
- 9157 45 **Comparison of the fiber optic dosimeter and semiconductor dosimeter for use in diagnostic radiology** [9157-85]
W. J. Yoo, S. H. Shin, H. I. Sim, S. Hong, S. G. Kim, J. S. Jang, J. S. Kim, H. S. Jeon, G. W. Kwon, K. W. Jang, Konkuk Univ. (Korea, Republic of); S. Cho, Soongsil Univ. (Korea, Republic of); B. Lee, Konkuk Univ. (Korea, Republic of)
- 9157 46 **Polarimetric fiber grating biosensor for *in-situ* high-sensitive intracellular density measurement** [9157-86]
T. Guo, F. Liu, Y. Liu, Jinan Univ. (China); N.-K. Chen, National United Univ. (Taiwan); B.-O. Guan, Jinan Univ. (China); J. Albert, Carleton Univ. (Canada)
- 9157 47 **Highly sensitive gas sensor based on graphene/microfiber hybrid waveguide with Mach-Zehnder interferometer** [9157-97]
Y. Wu, B. Yao, Y. Cheng, A. Zhang, Y. Gong, Y.-J. Rao, Univ. of Electronic Science and Technology of China (China)
- 9157 48 **Graphene-coated microfiber FBG for highly sensitive gas sensing** [9157-98]
B. Yao, Y. Wu, A. Zhang, Y. Cheng, C. Yu, Y. Gong, Y. Rao, Univ. of Electronic Science and Technology of China (China)
- 9157 49 **Dual-parameter monitoring based on fiber loop mirror assisted reflective long period fiber grating** [9157-104]
J. Yuan, C.-L. Zhao, G. Feng, J. Kang, S. Jin, China Jiliang Univ. (China)
- 9157 4A **Fabrication of a photocurable highly sensitive optical ammonia sensor for aquaculture application** [9157-107]
A. Aziz, N. Hafizah I., M. Norzaliman M. Z., G. Witjaksono, MIMOS Berhad (Malaysia)
- 9157 4B **Discrimination of chemical vapor and temperature using an in-line modal interferometer based on an exterior hole-assisted polarization-maintaining photonic crystal fiber** [9157-123]
M.-S. Yoon, N. Jun, Hanyang Univ. (Korea, Republic of); S. B. Lee, Korea Institute of Science and Technology (Korea, Republic of); Y.-G. Han, Hanyang Univ. (Korea, Republic of)

- 9157 4C **Simultaneous measurement of radiation dose and strain based on an erbium-doped fiber ring laser incorporating a fiber Bragg grating** [9157-124]
Y. B. Shim, Hanyang Univ. (Korea, Republic of); Y. Ji, Korea Institute of Radiological & Medical Science (Korea, Republic of); Y.-G. Han, Hanyang Univ. (Korea, Republic of)
- 9157 4D **Adiabatic tapered optical fiber fabrication for exciting whispering gallery modes in microcavities** [9157-131]
Z. Chenari, H. Latifi, R. S. Hashemi, F. Doroudmand, Shahid Beheshti Univ. (Iran, Islamic Republic of)
- 9157 4E **Tapered optical fibre sensor for detection of hydrocarbon spills in seawater** [9157-133]
J. A. Sánchez Martín, E. Bernabeu, A. Rodríguez Aramendía, A. Villalba, Univ. Complutense de Madrid (Spain); E. Cruzado, M. Pardo de Santayana, CEPISA (Spain)
- 9157 4F **Ultra-highly sensitive hydrogen sensor based on fiber Fabry-Perot interferometer with Pt/WO₃ coating** [9157-163]
Y. Wang, M. Yang, G. Zhang, J. Dai, Wuhan Univ. of Technology (China); Y. Zhang, Z. Zhuang, Institute of Structural Mechanics (China)
- 9157 4G **Eccentric core optical fiber for distributed sensing** [9157-179]
J. Liu, L. Yuan, Harbin Engineering Univ. (China)
- 9157 4H **A temperature compensated optical fibre bending sensor for physiological measurement** [9157-182]
M. A. Zawawi, Univ. of Limerick (Ireland) and Univ. Malaysia Pahang (Malaysia); S. O'Keeffe, E. Lewis, Univ. of Limerick (Ireland)
- 9157 4I **Real-time monitoring of intracellular signal transduction in PC12 cells by non-adiabatic tapered optical fiber biosensor** [9157-184]
M. I. Zibaii, H. Latifi, A. Asadollahi, Z. Noraeipoor, Shahid Beheshti Univ. (Iran, Islamic Republic of); L. Dargahi, Shahid Beheshti Univ. of Medical Sciences (Iran, Islamic Republic of)
- 9157 4J **Temperature and surrounding refractive index insensitive cascaded long period grating chemical sensor** [9157-202]
S. Korposh, S. W. James, Cranfield Univ. (United Kingdom); S.-W. Lee, Univ. of Kitakyushu (Japan); R. P. Tatam, Cranfield Univ. (United Kingdom)
- 9157 4K **Nonadiabatic tapered optical fiber biosensor for detection of potassium ion using DNA aptamer in neural application** [9157-206]
M. I. Zibaii, H. Latifi, A. Asadollahi, Shahid Beheshti Univ. (Iran, Islamic Republic of)
- 9157 4L **Radiation dosimetry with fiber Bragg gratings** [9157-214]
S. Avino, Istituto Nazionale di Ottica, CNR (Italy); V. D'Avino, Istituto di Biostrutture e Bioimmagini, CNR (Italy); A. Giorgini, Istituto Nazionale di Ottica, CNR (Italy); R. Pacelli, Istituto di Biostrutture e Bioimmagini, CNR (Italy) and Univ. degli Studi di Napoli Federico II (Italy); R. Liuzzi, L. Cella, Istituto di Biostrutture e Bioimmagini, CNR (Italy); G. Gagliardi, P. De Natale, Istituto Nazionale di Ottica, CNR (Italy)

- 9157 4M **An ultra-sensitive localised surface plasmon resonance fibre device for environmental sensing based upon a structured bi-metal coating** [9157-226]
T. Allsop, Aston Univ. (United Kingdom); R. Neal, Univ. of Plymouth (United Kingdom); C. Mou, Aston Univ. (United Kingdom); K. Kalli, Cyprus Univ. of Technology (Cyprus); D. J. Webb, Aston Univ. (United Kingdom)
- 9157 4N **Cardiac induced localised motion of the human torso detected by a long period grating fibre optic sensing scheme** [9157-229]
T. Allsop, Aston Univ. (United Kingdom); G. Lloyd, Moog Insensys Ltd. (United Kingdom); R. S. Bhambher, Instituto de Óptica, CSIC (Spain); L. Hadzievski, Univ. of Belgrade (Serbia); M. Halliday, Cytec Process Materials Ltd. (United Kingdom); D. J. Webb, Aston Univ. (United Kingdom)
- 9157 4O **Bent fused fiber taper intermodal interferometer as a refractive index sensor** [9157-233]
T. Effimov, Plovdiv Univ. (Bulgaria); W. J. Bock, Univ. du Québec en Outaouais (Canada); E. Penchev, Univ. of Food Technologies (Bulgaria)
- 9157 4P **Interferometric fiber sensor using exposed core microstructured optical fiber for refractive index based biochemical sensing** [9157-234]
L. V. Nguyen, S. C. Warren-Smith, A. Cooper, T. M. Monro, The Univ. of Adelaide (Australia)
- 9157 4Q **Controlling cone angle of the tapered tip fiber using dynamic etching** [9157-255]
H. Nikbakht, H. Latifi, T. Amini, Z. Chenari, Shahid Beheshti Univ. (Iran, Islamic Republic of)
- 9157 4R **Study of deformation of resin cements used in fixing of root posts through fiber Bragg grating sensors** [9157-264]
C. A. Pulido, Univ. Estadual de Ponta Grossa (Brazil); A. P. G. O. Franco, L. Z. Karam, H. J. Kalinowski, Univ. Tecnológica Federal do Paraná (Brazil); O. M. M. Gomes, Univ. Estadual de Ponta Grossa (Brazil)
- 9157 4S **Sensitive protein detection using an optical fibre long period grating sensor anchored with silica core gold shell nanoparticles** [9157-265]
L. Marques, F. U. Hernandez, The Univ. of Nottingham (United Kingdom); S. Korposh, The Univ. of Nottingham (United Kingdom) and Cranfield Univ. (United Kingdom); M. Clark, S. Morgan, The Univ. of Nottingham (United Kingdom); S. James, R. P. Tatam, Cranfield Univ. (United Kingdom)
- 9157 4T **Optical fiber refractometers based on localized surface plasmon resonance (LSPR) and lossy mode resonance (LMR)** [9157-290]
P. J. Rivero, M. Hernaez, J. Goicoechea, I. R. Matias, F. J. Arregui, Univ. Pública de Navarra (Spain)
- 9157 4U **A high sensitivity refractometer based on a tapered SCSMF structure and its application to biosensing** [9157-298]
Q. Wu, Y. Ma, Y. Semenova, Dublin Institute of Technology (Ireland); J. Yuan, Beijing Univ. of Posts and Telecommunications (China); L. Bo, P. Wang, Dublin Institute of Technology (Ireland); X. Sang, M. Teng, C. Yu, Beijing Univ. of Posts and Telecommunications (China); C. C. O'Mahony, Dublin City Univ. (Ireland); G. Farrell, Dublin Institute of Technology (Ireland)

- 9157 4V **Measuring water activity of aviation fuel using a polymer optical fiber Bragg grating** [9157-301]
W. Zhang, D. J. Webb, Aston Univ. (United Kingdom); M. Carpenter, C. Williams, Defence Academy of the United Kingdom (United Kingdom)
- 9157 4W **Design and synthesis of a fluorescent molecular imprinted polymer for use in an optical fibre-based cocaine sensor** [9157-305]
S. P. Wren, City Univ. London (United Kingdom); S. A. Piletsky, K. Karim, Cranfield Univ. (United Kingdom) and Univ. of Leicester (United Kingdom); P. Gascoine, Smiths Detection (United Kingdom); R. Lacey, Ctr. for Applied Science and Technology (United Kingdom); T. Sun, K. V. Grattan, City Univ. London (United Kingdom)
- 9157 4X **Interferometric microstructured polymer optical fiber ultrasound sensor for optoacoustic endoscopic imaging in biomedical applications** [9157-315]
D. Gallego, Univ. Carlos III de Madrid (Spain); D. Sáez-Rodríguez, D. Webb, Aston Univ. (United Kingdom); O. Bang, DTU Fotonik (Denmark); H. Lamela, Univ. Carlos III de Madrid (Spain)
- 9157 4Y **Analysis of organic solvents and liquid mixtures using a fiber-tip evaporation sensor** [9157-344]
E. Preter, Bar-Ilan Univ. (Israel); D. Donlagic, Univ. of Maribor (Slovenia); V. Artel, Bar-Ilan Univ. (Israel); R. A. Katims, Bar-Ilan Univ. (Israel) and Binghamton Univ. (United States); C. N. Sukenik, A. Zadok, Bar-Ilan Univ. (Israel)
- 9157 4Z ***In-situ* detection of DNA hybridization with a microfiber Bragg grating biosensor** [9157-385]
D. Sun, T. Guo, X. Xie, Y. Ran, Y. Huang, B.-O. Guan, Jinan Univ. (China)
- 9157 50 **Experimental investigation of long period grating working in transition mode** [9157-414]
L. Melo, G. Burton, S. Warwick, P. Wild, Univ. of Victoria (Canada)
- 9157 51 **Ultrasensitive refractive index sensor based on elliptic microfibers fabricated by CO₂ laser** [9157-424]
L.-P. Sun, J. Li, L. Jin, B.-O. Guan, Jinan Univ. (China)
- 9157 52 **Selective sensing of alcohols in water influenced by chemically Zeolite coatings on optical fiber sensors** [9157-464]
M. Nazari, Victoria Univ. (Australia) and CSIRO Materials Science and Engineering (Australia); M. R. Hill, CSIRO Materials Science and Engineering (Australia); M. Duke, F. Sidirolou, S. F. Collins, Victoria Univ. (Australia)
- 9157 53 **Fiber enhanced Raman spectroscopy** [9157-513]
T. Frosch, Institut für Photonische Technologien e.V. (Germany) and Friedrich-Schiller Univ. (Germany); D. Yan, S. Hanf, Institut für Photonische Technologien e.V. (Germany); J. Popp, Institut für Photonische Technologien e.V. (Germany) and Friedrich-Schiller Univ. (Germany)
- 9157 54 **Spectral-domain OCT imaging using a spectrally flexible wavelength-swept fiber laser based on dispersion tuning** [9157-517]
Y. Takubo, S. Yamashita, The Univ. of Tokyo (Japan)
- 9157 55 **UV resonance Raman sensing of pharmaceutical drugs in hollow fibers** [9157-518]
D. Yan, Institut für Photonische Technologien e.V. (Germany); J. Popp, T. Frosch, Institut für Photonische Technologien e.V. (Germany) and Friedrich-Schiller Univ. (Germany)

- 9157 56 **Fiber-optical particle sizing by photon density wave spectroscopy** [9157-522]
L. Bressel, M. Münzberg, R. Hass, O. Reich, Univ. of Potsdam (Germany)
- 9157 57 **Bacteriophage adhesin-coated long-period gratings for bacterial lipopolysaccharide recognition** [9157-559]
M. Koba, Univ. du Québec en Outaouais (Canada); M. Śmietana, Warsaw Univ. of Technology (Poland); E. Brzozowska, S. Górka, Institute of Immunology and Experimental Therapy (Poland); P. Mikulic, W. J. Bock, Univ. du Québec en Outaouais (Canada)
- 9157 58 **Highly sensitive evanescent-wave water salinity sensor realized with rectangular optical microfiber Sagnac interferometer** [9157-565]
C. Wu, L. Sun, J. Li, B.-O. Guan, Jinan Univ. (China)
- 9157 59 **SPR sensors in POF: a new experimental configuration for extended refractive index range and better SNR** [9157-586]
N. Cennamo, Seconda Univ. degli Studi di Napoli (Italy); L. Coelho, INESC Porto (Portugal) and Univ. do Porto (Portugal); A. Guerreiro, Univ. do Porto (Portugal) and INESC Porto (Portugal); P. A. S. Jorge, INESC Porto (Portugal); L. Zeni, Seconda Univ. degli Studi di Napoli (Italy)
- 9157 5A **Optical fiber refractometer based on silicon nitride nano-overlay deposited with PECVD method** [9157-607]
B. Michalak, M. Śmietana, Warsaw Univ. of Technology (Poland); M. Koba, Warsaw Univ. of Technology (Poland) and National Institute of Telecommunications (Poland)
- 9157 5B **Nitrogen dioxide detector based on femtosecond TFBG coated with LuPc₂ in P(S-bMMA) polymer matrix** [9157-611]
A. Bueno, Univ. de Mons (Belgium); D. Lahem, MateriaNova (Belgium); M. Debliqy, C. Caucheteur, P. Mégret, Univ. de Mons (Belgium)
- 9157 5C **Highly sensitive and selective optical fiber fluorescence sensor for lead ion detection in water using corrugated long period fiber grating** [9157-640]
Y. Chiniforooshan, J. Ma, W. J. Bock, Univ. du Québec en Outaouais (Canada); W. Hao, Carleton Univ. (Canada); Z. Y. Wang, Carleton Univ. (Canada) and Changchun Institute of Applied Chemistry (China)
- 9157 5D **Intradiscal pressure variation under spontaneous ventilation** [9157-646]
P. Roriz, Univ. de Aveiro (Portugal), INESC Porto (Portugal), and Univ. of Porto (Portugal); J. Ferreira, INESC Porto (Portugal) and Univ. do Porto (Portugal); J. C. Potes, M. T. Oliveira, Univ. de Évora (Portugal); J. L. Santos, INESC Porto (Portugal) and Univ. do Porto (Portugal); J. A. Simões, Univ. de Aveiro (Portugal); O. Frazão, INESC Porto (Portugal) and Univ. do Porto (Portugal)
- 9157 5E **Analysis of phase interrogation of SPR fiber optic sensors with characteristics tailored by the application of different metal-dielectric overlays** [9157-651]
H. Moayyed, I. T. Leite, L. Coelho, J. L. Santos, A. Guerreiro, INESC TEC (Portugal) and Univ. do Porto (Portugal); D. Viegas, INESC TEC (Portugal) and Cabelte, S.A. (Portugal)

- 9157 5F **Stack of PECVD silicon nitride nano-films on optical fiber end-face for refractive index sensing** [9157-653]
M. Śmietana, Warsaw Univ. of Technology (Poland); M. Koba, Warsaw Univ. of Technology (Poland) and National Institute of Telecommunications (Poland); R. Różycki-Bakon, Warsaw Univ. of Technology (Poland)
- 9157 5G **Reflection-type long period grating biosensor for the detection of drug resistant bacteria: The Opto-bacteria Project** [9157-656]
M. Consales, G. Quero, Univ. degli Studi del Sannio (Italy); S. Zuppolini, L. Sansone, A. Borriello, Istituto per i Materiali Compositi e Biomedici. CNR (Italy); M. Giordano, Optosmart S.r.l. (Italy); A. Venturelli, Tydock Pharma S.r.l (Italy); A. Cusano, Univ. degli Studi del Sannio (Italy)
- 9157 5H **OCT assessment of aortic wall degradation for surgical guidance** [9157-662]
E. Real, Univ. de Cantabria (Spain); J. F. Val-Bernal, A. Pontón, M. Calvo Díez, M. Mayorga, J. M. Revuelta, Marqués de Valdecilla Univ. Hospital (Spain) and Univ. de Cantabria (Spain); J. M. López-Higuera, O. M. Conde, Univ. de Cantabria (Spain)
- 9157 5I **Optical fibre cantilever sensor for biological application** [9157-669]
J. Li, Y. X. Zhou, G. Patterson, W. M. Shu, R. R. J. Maier, R. Fowler, D. P. Hand, W. N. MacPherson, Heriot-Watt Univ. (United Kingdom)
- 9157 5J **The magnitude of a human bite measured exactly at the molar Intercuspidation using FBG** [9157-507]
G. C. Marin, Univ. Tecnológica Federal do Paraná (Brazil) and Pontifícia Univ. Católica do Paraná (Brazil); M. S. Milczewski, I. Abe, S. C. P. S. Lopes, Univ. Tecnológica Federal do Paraná (Brazil); E. S. Camargo, Pontifícia Univ. Católica do Paraná (Brazil); H. J. Kalinowski, Univ. Tecnológica Federal do Paraná (Brazil)
- 9157 5K **Brillouin distributed sensor over a 200km fiber-loop using a dual-pump configuration and colour coding** [9157-36]
S. Le Floch, F. Sauser, M. Llera, Haute Ecole Arc Ingénierie Siège (Switzerland); E. Rochat, Omnisens S.A. (Switzerland)
- 9157 5L **Cyclic pulse coding for hybrid fast BOTDA/Raman sensor** [9157-42]
Y. Muanenda, M. Taki, I. Toccafondo, A. Signorini, T. Nannipieri, C. J. Oton, F. Di Pasquale, Scuola Superiore Sant'Anna (Italy)
- 9157 5M **A fast high-spatial-resolution Raman distributed temperature sensor** [9157-52]
Y. Chen, A. H. Hartog, R. J. Marsh, I. M. Hilton, M. R. Hadley, P. A. Ross, Schlumberger Fiber-Optic Technology Ctr. (United Kingdom)
- 9157 5N **Distributed vibration sensing on optical fibre: field testing in borehole seismic applications** [9157-53]
A. H. Hartog, Schlumberger Fiber-Optic Technology Ctr. (United Kingdom); B. Frignet, Services Techniques Schlumberger (France); D. Mackie, Schlumberger Evaluation and Production Services (United Kingdom); O. I. Kotov, L. B. Liokumovich, St. Petersburg State Polytechnical Univ. (Russian Federation)
- 9157 5O **A novel intrusion signal processing method for phase-sensitive optical time-domain reflectometry (Φ -OTDR)** [9157-99]
H. Wu, X. Li, Z. Peng, Y. Rao, Univ. of Electronic Science and Technology of China (China)

- 9157 5P **154.4km BOTDA based on hybrid distributed Raman amplifications** [9157-103]
Y.-J. Rao, X.-H. Jia, Z.-N. Wang, W.-L. Zhang, C.-X. Yuan, J. Li, X.-D. Yan, H. Wu, Y.-Y. Zhu, F. Peng, Univ. of Electronic Science and Technology of China (China)
- 9157 5Q **Evaluating distributed fibre optic sensors integrated into thermoplastic composites for structural health monitoring** [9157-122]
C. Schilder, M. Schukar, M. Steffen, K. Krebber, Bundesanstalt für Materialforschung und -prüfung (Germany)
- 9157 5R **Motion compensation in distributed fiber optic sensing via optical frequency domain reflectometry** [9157-152]
J. J. Bos, N. A. Abdul Rahim, Luna Innovations Inc. (United States)
- 9157 5S **Modelling the depletion length induced by modulation instability in distributed optical fibre sensors** [9157-177]
M. Alem, M. A. Soto, L. Thévenaz, Ecole Polytechnique Fédérale de Lausanne (Switzerland)
- 9157 5T **Enhanced response in Brillouin distributed optical fibre sensors by simultaneous time and frequency pump multiplexing** [9157-188]
M. A. Soto, Ecole Polytechnique Fédérale de Lausanne (Switzerland); A. L. Ricchiuti, Univ. Politècnica de València (Spain); L. Zhang, Ecole Polytechnique Fédérale de Lausanne (Switzerland); D. Barrera, S. Sales, Univ. Politècnica de València (Spain); L. Thévenaz, Ecole Polytechnique Fédérale de Lausanne (Switzerland)
- 9157 5U **Phasorial DPP-BOTDA sensor tolerant to non-local effects** [9157-215]
J. Urricelqui, J. Mariñelarena, M. Sagues, A. Loayssa, Univ. Pública de Navarra (Spain)
- 9157 5V **First observation of Brillouin scattering in tapered plastic optical fiber** [9157-216]
N. Hayashi, H. Fukuda, Y. Mizuno, K. Nakamura, Tokyo Institute of Technology (Japan)
- 9157 5W **Distributed optical fiber sensors for integrated monitoring of railway infrastructures** [9157-224]
A. Minardo, A. Coscetta, Seconda Univ. degli Studi di Napoli (Italy); G. Porcaro, Tecnomatica SaS (Italy); D. Giannetta, Ferrovie del Gargano, Direzione di Esercizio (Italy); R. Bernini, Istituto per il Rilevamento Elettromagnetico dell'Ambiente, CNR (Italy); L. Zeni, Seconda Univ. degli Studi di Napoli (Italy)
- 9157 5X **High-performance in-line Brillouin optical correlation domain analysis** [9157-244]
J. H. Jeong, Korea Institute of Science and Technology (Korea, Republic of); K. Y. Song, Chung-Ang Univ. (Korea, Republic of); S. B. Lee, K. Lee, Korea Institute of Science and Technology (Korea, Republic of)
- 9157 5Y **Multi-wavelength erbium fiber ring laser with optical feedback for temperature measurements** [9157-248]
S. Diaz, D. Leandro, M. Lopez-Amo, Univ. Pública de Navarra (Spain)
- 9157 5Z **124km phase-sensitive OTDR with Brillouin amplification** [9157-257]
J. Li, Z. Wang, L. Zhang, F. Peng, S. Xiao, H. Wu, Y. Rao, Univ. of Electronic Science and Technology of China (China)

- 9157 60 **Interrogation system for fiber loop mirror sensors using OTDR** [9157-261]
M. T. M. Rocco Giraldi, Military Institute of Engineering (Brazil) and INESC Porto (Portugal); C. S. Fernandes, Univ. Federal do Pará (Brazil) and INESC Porto (Portugal); M. S. Ferreira, INESC Porto (Portugal) and Univ. do Porto (Portugal); J. W. Costa, Univ. Federal do Pará (Brazil); J. L. Santos, O. Frazão, INESC Porto (Portugal) and Univ. do Porto (Portugal)
- 9157 61 **Real distributed vibration sensing with high frequency response based on pulse pair** [9157-284]
Q. He, T. Zhu, X. Xiao, D. Diao, W. Huang, Chongqing Univ. (China); X. Bao, Univ. of Ottawa (Canada)
- 9157 62 **High sensitive micro-displacement intensity fiber sensor by using a multiwavelength erbium doped fiber ring laser based on optical add-drop multiplexers** [9157-285]
R. A. Perez-Herrera, D. Leandro, M. Lopez-Amo, Univ. Pública de Navarra (Spain)
- 9157 63 **Acoustic fiber laser array architecture with reduced optical feedback limitations** [9157-300]
S. Molin, Thales Research & Technology (France); R. Bouffaron, A. Peigné, M. Doisy, Thales Underwater Systems (France); A. Mugnier, D. Pureur, Quantel (France)
- 9157 64 **Mitigation of polarization fading in BOTDR sensors by using optical pulses with orthogonal polarizations** [9157-308]
Y. Cao, Shanghai Institute of Optics and Fine Mechanics (China) and Univ. of Chinese Academy of Sciences (China); Q. Ye, Z. Pan, H. Cai, R. Qu, Z. Fang, Shanghai Institute of Optics and Fine Mechanics (China); H. Zhao, Shanghai Bandweaver Technologies Co. Ltd. (China) and Shanghai Synet Optics Corp. (China)
- 9157 65 **Balanced detection in Brillouin optical time domain analysis** [9157-318]
A. Dominguez-Lopez, A. Lopez-Gil, S. Martin-Lopez, M. Gonzalez-Herraez, Univ. de Alcalá (Spain)
- 9157 66 **Fiber optical sensor system for shape and haptics for flexible instruments in minimally invasive surgery: overview and status quo** [9157-334]
C. Ledermann, H. Pauer, H. Woern, Karlsruhe Institute of Technology (Germany)
- 9157 67 **Fading statistics in Rayleigh interferometric fiber sensors** [9157-336]
G. H. Ames, W. R. Donat, Naval Undersea Warfare Ctr. (United States)
- 9157 68 **Advanced hybrid BOFDA/FBG sensor system for simultaneously point-wise and distributed temperature/strain measurements** [9157-337]
F. Zaidi, Bundesanstalt für Materialforschung und -prüfung (Germany) and Scuola Superiore Sant'Anna (Italy); K. Krebber, Bundesanstalt für Materialforschung und -prüfung (Germany)
- 9157 69 **Synthesis of virtual Brillouin frequency shift profiles in BOTDA sensors using optical source dithering** [9157-340]
J. Urricelqui, M. Sagues, A. Loayssa, Univ. Pública de Navarra (Spain)
- 9157 6A **Polarization diversity for Brillouin distributed fiber sensors based on a double orthogonal pump** [9157-341]
J. Urricelqui, F. López-Fernandino, M. Sagues, A. Loayssa, Univ. Pública de Navarra (Spain)

- 9157 6B **Few millimeter-resolution Brillouin optical correlation domain analysis using amplified-spontaneous-emission pump and signal waves** [9157-342]
R. Cohen, Y. London, Y. Antman, A. Zadok, Bar-Ilan Univ. (Israel)
- 9157 6C **Distributed audio recording using OFDR with double interrogation** [9157-347]
H. Gabai, A. Eyal, Tel Aviv Univ. (Israel)
- 9157 6D **Optimized four-section bright-pulse distributed Brillouin sensor with high spatial resolution** [9157-352]
Z. Yang, X. Hong, H. Guo, J. Wu, J. Lin, Beijing Univ. of Posts and Telecommunications (China)
- 9157 6E **Detection of local birefringence in embedded fiber Bragg grating caused by concentrated transverse load using optical frequency domain reflectometry** [9157-367]
D. Wada, H. Murayama, The Univ. of Tokyo (Japan); H. Igawa, Japan Aerospace Exploration Agency (Japan)
- 9157 6F **End-reflection assisted time domain Brillouin sensing with a novel probe pulse arrangement for branched fiber** [9157-373]
C. Kito, F. Ito, H. Takahashi, K. Toge, NTT Access Network Service Systems Labs. (Japan)
- 9157 6G **Brillouin optical correlation domain reflectometry with double frequency modulation and phase modulation** [9157-384]
O. Matsuoka, M. Kishi, K. Hotate, The Univ. of Tokyo (Japan)
- 9157 6H **Effect of laser linewidth on phase-OTDR based distributed vibration sensing regime** [9157-398]
L. Shi, T. Zhu, Q. He, S. Huang, Chongqing Univ. (China)
- 9157 6I **Simplified Brillouin optical time-domain analysis with extended measurement range by frequency dithering** [9157-407]
J. G. Hong, K. Y. Song, Chung-Ang Univ. (Korea, Republic of)
- 9157 6J **High spatial resolution OFDR based on broadened optical frequency sweeping by four-wave-mixing** [9157-420]
D. Xu, J. Du, X. Fan, Q. Liu, Z. He, Shanghai Jiao Tong Univ. (China)
- 9157 6K **Comparison of the use of first and second-order Raman amplification to assist a phase-sensitive optical time domain reflectometer in distributed vibration sensing over 125 km** [9157-432]
H. F. Martins, INESC TEC (Portugal), Univ. do Porto (Portugal), and Univ. de Alcalá (Spain); S. Martin-Lopez, Univ. de Alcalá (Spain); M. L. Filograno, P. Corredera, Instituto de Óptica, CSIC (Spain); O. Frazão, INESC TEC (Portugal) and Univ. do Porto (Portugal); M. Gonzalez-Herraez, Univ. de Alcalá (Spain)
- 9157 6L **Cavity and random ultralong lasers in BOTDA amplification** [9157-459]
J. Nuño, J. D. Ania-Castañón, Instituto de Óptica, CSIC (Spain)
- 9157 6M **Effect of pump-read optical path difference on the measurement of Brillouin dynamic grating spectra localized by the correlation domain technique with a single laser setup** [9157-466]
R. K. Yamashita, M. Kishi, K. Hotate, The Univ. of Tokyo (Japan)

- 9157 6N **Distributed temperature monitoring for liquid sodium leakage detection using OFDR-based Rayleigh backscattering** [9157-476]
E. Boldyreva, R. Cotillard, G. Laffont, P. Ferdinand, Lab. de Mesures Optiques, LIST, CEA (France); D. Cambet, J.-P. Jeannot, P. Charvet, S. Albaladéjo, G. Rodriguez, DEN, DTN, CEA (France)
- 9157 6O **Combined time-domain and correlation-domain Brillouin analysis with 1600 meters range and 2 centimeters resolution** [9157-489]
D. Elooz, Y. Antman, A. Zadok, Bar-Ilan Univ. (Israel)
- 9157 6P **Fully switchable multi-wavelength fiber laser based interrogator system for remote and versatile fiber optic sensors multiplexing structures** [9157-463]
M. Bravo, V. DeMiguel-Soto, A. Ortigosa, M. Lopez-Amo, Univ. Pública de Navarra (Spain)
- 9157 6Q **Extending the sensing range of Brillouin optical time-domain analysis up to 325km combining four optical repeaters** [9157-531]
F. Gyger, E. Rochat, S. Chin, M. Niklès, Omnisens S.A. (Switzerland); L. Thévenaz, Ecole Polytechnique Fédérale de Lausanne (Switzerland)
- 9157 6R **Characterization of fast acoustic wave propagation using OFDR with double interrogation and frequency tracking** [9157-542]
H. Gabai, A. Eyal, Tel-Aviv Univ. (Israel)
- 9157 6S **Simultaneous vibration and quasi-distributed strain measurement using incoherent OFDR and extrinsic Fabry-Perot interferometers** [9157-557]
M. Steffen, S. Liehr, F. Basedau, K. Krebber, Bundesanstalt für Materialforschung und -prüfung (Germany)
- 9157 6T **Fractional Fourier transform reflectometry** [9157-561]
L. Shiloh, A. Eyal, Tel Aviv Univ. (Israel)
- 9157 6U **Hydrogen and radiation induced effects on performances of Raman fiber-based temperature sensors** [9157-567]
C. Cangialosi, Lab. Hubert Curien, CNRS, Univ. de Lyon (France) and Univ. degli studi di Palermo (Italy); Y. Ouerdane, S. Girard, A. Boukenter, Lab. Hubert Curien, CNRS, Univ. de Lyon (France); M. Cannas, Univ. degli Studi di Palermo (Italy); S. Delepine-Lesoille, J. Bertrand, ANDRA (France); P. Paillet, DAM, DIF, CEA (France)
- 9157 6V **Brillouin optical frequency domain analysis in polymer optical fiber** [9157-571]
A. Minardo, Seconda Univ degli Studi di Napoli (Italy); R. Bernini, Istituto per il Rilevamento Elettromagnetico dell'Ambiente, CNR (Italy); L. Zeni, Seconda Univ degli Studi di Napoli (Italy)
- 9157 6W **Novel technique for distributed fibre sensing based on faint long gratings (FLOGs)** [9157-601]
L. Thévenaz, S. Chin, Ecole Polytechnique Fédérale de Lausanne (Switzerland); J. Sancho, S. Sales, Univ. Politècnica de València (Spain)

- 9157 6X **High sampling rate multi-pulse phase-sensitive OTDR employing frequency division multiplexing** [9157-635]
Z. Pan, Shanghai Institute of Optics and Fine Mechanics (China); Z. Wang, Shanghai Institute of Optics and Fine Mechanics (China) and Univ. of Chinese Academy of Sciences (China); Q. Ye, H. Cai, R. Qu, Z. Fang, Shanghai Institute of Optics and Fine Mechanics (China)
- 9157 6Y **Fast distributed temperature sensing using Brillouin beat spectrum of large effective area fiber (LEAF)** [9157-639]
S. M. Haneef, P. PP, B. S., D. Venkitesh, B. Srinivasan, Indian Institute of Technology Madras (India)
- 9157 6Z **Distributed detection and localization of multiple dynamic perturbations using coherent correlation OTDR** [9157-654]
M. G. Shlyagin, A. Arias, Ctr. de Investigación Científica y de Educación Superior de Ensenada (Mexico); R. Martinez Manuel, Univ. of Johannesburg (South Africa)

DISTRIBUTED AND MICRO-NANO-STRUCTURED FIBER SENSORS

- 9157 70 **Brillouin dynamic grating time-domain slope-assisted fast and distributed strain sensing** [9157-313]
A. Bergman, L. Yaron, T. Langer, M. Tur, Tel-Aviv Univ. (Israel)
- 9157 71 **Mapping the refractive index changes along Yb-doped fibers pumped at 976nm based on acousto-optic interaction** [9157-462]
E. P. Alcusa-Sáez, A. Díez, M. V. Andrés, Univ. de València (Spain)
- 9157 72 **Source-induced noise in stimulated Brillouin scattering** [9157-472]
O. Shlomovits, T. Langer, M. Tur, Tel-Aviv Univ. (Israel)
- 9157 73 **A novel refractive index sensor based on an induced micro-structure fiber** [9157-227]
G.-R. Lin, M. D. Baiad, M. Gagne, Ecole Polytechnique de Montréal (Canada); W.-F. Liu, Feng-Chia Univ. (Taiwan); R. Kashyap, Ecole Polytechnique de Montréal (Canada)

MICRO-STRUCTURED AND LASER POST-PROCESSED FIBER SENSORS

- 9157 74 **Hybrid fibers: a base for creating new sensing fibers (Invited Paper)** [9157-680]
M. A. Schmidt, Max Planck Institute for the Science of Light (Germany)
- 9157 75 **Bend-insensitive fiber based vibration sensor** [9157-275]
Y. Xu, P. Lu, F. Baset, V. R. Bhardwaj, X. Bao, Univ. of Ottawa (Canada)
- 9157 76 **Highly birefringent suspended core photonic microcells for sensing applications** [9157-335]
C. Wang, W. Jin, W. Jin, J. Ma, H. L. Ho, The Hong Kong Polytechnic Univ. (Hong Kong, China)

- 9157 77 **Microstructured optical fiber Bragg grating-based strain and temperature sensing in the concrete buffer of the Belgian supercontainer concept** [9157-343]
T. Geernaert, S. Sulejmani, C. Sonnenfeld, Vrije Univ. Brussel (Belgium); G. Luyckx, Univ. Gent (Belgium); K. Chah, Univ. de Mons (Belgium); L. Areias, Vrije Univ. Brussel (Belgium) and EIG EURIDICE (Belgium); P. Mergo, Marie Curie-Sklodowska Univ. (Poland); W. Urbanczyk, Wroclaw Univ. of Technology (Poland); P. Van Marcke, E. Coppens, ONDRAF/NIRAS (Belgium); H. Thienpont, F. Berghmans, Vrije Univ. Brussel (Belgium)
- 9157 78 **Tunable phase-shifted FBG based on an in-grating bubble** [9157-396]
C. Liao, Shenzhen Univ. (China); L. Xu, Shenzhen Institute of Information Technology (China); Y. Wang, Shenzhen Univ. (China); D. N. Wang, The Hong Kong Polytechnic Univ. (Hong Kong, China); Q. Wang, Z. Li, X. Zhong, J. Zhou, Y. Liu, Shenzhen Univ. (China)

Part Three

SENSOR APPLICATION AND FIELD TESTS I

- 9157 79 **Precise sensing utilizing optical fiber for space craft (Invited Paper)** [9157-681]
T. Mizutani, Japan Aerospace Exploration Agency (Japan)
- 9157 7A **Field test for real-time position and speed monitoring of trains using phase-sensitive optical time domain reflectometry (Φ -OTDR)** [9157-258]
N. Duan, F. Peng, Y.-J. Rao, J. Du, Y. Lin, Univ. of Electronic Science and Technology of China (China)
- 9157 7B **Glue-induced birefringence in surface-attached FBG strain sensors** [9157-323]
D. Helminger, A. Daitche, J. Roths, Hochschule für Angewandte Wissenschaften München (Germany)
- 9157 7C **Birefringence upper limit analysis of low birefringence fibers employed in the Faraday effect current sensors** [9157-333]
N. Vukovic, M. Segura Sarmiento, T. May-Smith, W. H. Loh, M. N. Zervas, Univ. of Southampton (United Kingdom)
- 9157 7D **Signal-to-noise ratio evaluation with draw tower fibre Bragg gratings (DTGs) for dynamic strain sensing at elevated temperatures and corrosive environment** [9157-453]
B. De Pauw, Vrije Univ. Brussel (Belgium) and SCK CEN (Belgium); A. Lamberti, S. Vanlanduit, Vrije Univ. Brussel (Belgium); K. Van Tichelen, SCK CEN (Belgium); T. Geernaert, F. Berghmans, Vrije Univ. Brussel (Belgium)

SENSOR APPLICATION AND FIELD TESTS II

- 9157 7E **Fiber optic system for the real time detection, localization, and classification of damage in composite aircraft structures (Invited Paper)** [9157-682]
E. Mendoza, J. Prohaska, C. Kempen, Y. Esterkin, S. Sun, Redondo Optics, Inc. (United States); S. Krishnaswamy, Northwestern Univ. (United States)

- 9157 7F **Regeneration experiments with fibre Bragg gratings in hydrogen out-diffused fibres** [9157-497]
L. Polz, A. Dörfler, Hochschule für Angewandte Wissenschaften München (Germany);
H. Bartelt, Institut für Photonische Technologien e.V. (Germany); J. Roths, Hochschule für Angewandte Wissenschaften München (Germany)
- 9157 7G **Femtosecond laser aided processing of optical sensor fibers for 3D medical navigation and tracking (FiberNavi)** [9157-540]
C. Waltermann, J. Koch, M. Angelmahr, W. Schade, M. Witte, Fraunhofer-Institut für Nachrichtentechnik Heinrich-Hertz-Institut (Germany); N. Kohn, D. Wilhelm, A. Schneider, S. Reiser, H. Feussner, Technische Univ. München (Germany)

POSTER SESSION III

- 9157 7H **Optical loading sensor based on single polarization fiber laser incorporating an intra-cavity 45°-TFG** [9157-92]
Z. Sun, C. Mou, Z. Yan, Aston Univ. (United Kingdom); X. Wang, Aston Univ. (United Kingdom) and Nanjing Univ. (United Kingdom); L. Zhang, Aston Univ. (United Kingdom)
- 9157 7I **Highly focused conical optical field for Pico-Newton scale force sensing** [9157-128]
H. Deng, L. Yuan, Harbin Engineering Univ. (China)
- 9157 7J **Dual-optical-response photonic crystal fibre interferometer for multi-parameter sensing** [9157-144]
J. Villatoro, Univ. del País Vasco (Spain) and IKERBASQUE (Spain); V. P. Minkovich, Ctr. de Investigaciones en Óptica, A.C. (Mexico); J. Zubia, Univ. del País Vasco (Spain)
- 9157 7K **Absolute strain measurement based on a microfiber Mach-Zehnder interferometer** [9157-151]
S.-J. Kim, M.-S. Yoon, S. Kim, O.-J. Kwon, Y.-G. Han, Hanyang Univ. (Korea, Republic of)
- 9157 7L **Dual-environment pressure sensor using a photonic-crystal fiber** [9157-180]
J. H. Osório, J. G. Hayashi, Y. A. V. Espinel, Univ. Estadual de Campinas (Brazil);
M. A. R. Franco, Instituto de Estudos Avançados (Brazil); M. V. Andrés, Univ. de València (Spain); C. M. B. Cordeiro, Univ. Estadual de Campinas (Brazil)
- 9157 7M **Phase sensitivity of hollow-core photonic bandgap fiber to internal gas pressure** [9157-198]
Y. Cao, F. Yang, H. L. Ho, W. Jin, The Hong Kong Polytechnic Univ. (Hong Kong, China)
- 9157 7N **Long period gratings in highly birefringent microfibers** [9157-200]
W. Jin, H. Xuan, W. Jin, The Hong Kong Polytechnic Univ. (Hong Kong, China)
- 9157 7O **Characterization of a hybrid Fabry-Perot Cavity based on a four-bridge double-Y-shape-core microstructured fiber** [9157-219]
A. M. R. Pinto, A. Lopez-Aldaba, M. Lopez-Amo, Univ. Pública de Navarra (Spain);
O. Frazao, J. L. Santos, INESC Porto (Portugal); J. M. Baptista, INESC Porto (Portugal) and Univ. da Madeira (Portugal); H. Baierl, J.-L. Auguste, R. Jamier, P. Roy, XLIM, CNRS, Univ. de Limoges (France)

- 9157 7P **Microstructured optical fiber Bragg grating-based shear stress sensing in adhesive bonds** [9157-221]
S. Sulejmani, C. Sonnenfeld, T. Geernaert, Vrije Univ. Brussel (Belgium); G. Luyckx, Univ. Gent (Belgium); D. Van Hemelrijck, Vrije Univ. Brussel (Belgium); P. Mergo, K. Skorupski, Marie Curie-Sklodowska Univ. (Poland); W. Urbanczyk, Wroclaw Univ. of Technology (Poland); K. Chah, Univ. de Mons (Belgium); H. Thienpont, F. Berghmans, Vrije Univ. Brussel (Belgium)
- 9157 7Q **All-fiber loading sensor based on 45° and 81° tilted fiber gratings** [9157-231]
Z. Sun, Z. Yan, C. Mou, Aston Univ. (United Kingdom); X. Wang, Aston Univ. (United Kingdom) and Nanjing Univ. (China); J. Li, Aston Univ. (China) and Univ. of Electronic Science and Technology of China (China); L. Zhang, Aston Univ. (United Kingdom)
- 9157 7R **Hollow-core photonic bandgap fiber gas sensor with high sensitivity and fast response** [9157-236]
F. Yang, W. Jin, Y. Cao, H. Ho, The Hong Kong Polytechnic Univ. (Hong Kong, China)
- 9157 7S **Sensitivity improvements of exposed-core microstructured optical fibre Bragg grating refractive index sensors** [9157-240]
S. C. Warren-Smith, T. M. Monro, The Univ. of Adelaide (Australia)
- 9157 7T **Optical fiber Fabry-Pérot sensor fabrication based on focused ion beam post-processing** [9157-249]
R. M. Andre, INESC Porto (Portugal), Univ. do Porto (Portugal), and Institut für Photonische Technologien e.V. (Germany); S. Pevec, Univ. of Maribor (Slovenia); M. Becker, J. Dellith, M. Rothhardt, Institut für Photonische Technologien e.V. (Germany); M. B. Marques, INESC Porto (Portugal) and Univ. do Porto (Portugal); D. Donlagic, Univ. of Maribor (Slovenia); H. Bartelt, Institut für Photonische Technologien e.V. (Germany); O. Frazão, INESC Porto (Portugal) and Univ. do Porto (Portugal)
- 9157 7U **Microtips at photonic crystal fibers as functional elements for near-field scanning optical microscopy probes** [9157-251]
P. Pura, Military Univ. of Technology (Poland); M. Szymański, Military Univ. of Technology (Poland) and InPhoTech Ltd. (Poland); L. R. Jaroszewicz, P. Marć, Military Univ. of Technology (Poland); M. Dudek, M. Kujawińska, Warsaw Univ. of Technology (Poland); M. Napierała, T. Nasiłowski, Ł. Ostrowski, Military Univ. of Technology (Poland) and InPhoTech Ltd. (Poland)
- 9157 7V **D-shape optical fiber refractometer based on TM and TE lossy mode resonances** [9157-263]
P. Zubiate, C. R. Zamarreño, I. Del Villar, I. R. Matias, F. J. Arregui, Univ. Pública de Navarra (Spain)
- 9157 7W **In-fiber integrated microfluidic sensor based on optical fiber with suspended core** [9157-276]
T. Yuan, X. Yang, Harbin Engineering Univ. (China); P. Teng, Harbin First Machinery Manufacturing Group Co. Ltd. (China); C. Liu, E. Li, E. Zhao, L. Yuan, Harbin Engineering Univ. (China)
- 9157 7X **Improved arc discharge technique for inscribing compact long period fiber gratings** [9157-291]
G. Yin, Y. Wang, C. Liao, J. Zhou, X. Zhong, S. Liu, Q. Wang, Z. Li, B. Sun, J. He, G. Wang, Shenzhen Univ. (China)

- 9157 7Y **Carbon-nanotube-deposited photonic crystal fiber for refractive index sensing** [9157-294]
Y. C. Tan, Z. Q. Tou, V. Mamidala, K. K. Chow, C. C. Chan, Nanyang Technological Univ. (Singapore)
- 9157 7Z **Magnetic field tunability of square tapered no-core fibers** [9157-302]
Y. Miao, J. Wu, Tianjin Univ. of Technology (China); W. Lin, Nankai Univ. (China); K. Zhang, Tianjin Univ. of Technology (China); B. Song, H. Zhang, B. Liu, Nankai Univ. (China)
- 9157 80 **Micro Fabry-Perot interferometer based on suspended core created by etching microstructure fiber** [9157-306]
R. Wang, X. Qiao, Northwest Univ. (China)
- 9157 81 **A fiber tip refractive index sensor using FIB-milled gold-coated singlemode-multimode-singlemode structure** [9157-346]
M. Ding, BeiHang Univ. (China) and Univ. of Southampton (United Kingdom); P. Wang, Dublin Institute of Technology (Ireland); J. Wang, Beijing Aerospace Times Optical-Electronic Technology Co. (China); H. Yuan, Beihang Univ. (China); G. Brambilla, Univ. of Southampton (United Kingdom)
- 9157 82 **Extruded single ring hollow core optical fibers for Raman sensing** [9157-361]
G. Tsiminis, K. J. Rowland, H. Ebendorff-Heidepriem, The Univ. of Adelaide (Australia); N. A. Spooner, The Univ. of Adelaide (Australia) and Defence Science and Technology Organisation (Australia); T. M. Monro, The Univ. of Adelaide (Australia)
- 9157 83 **Microstructure-FBG hybrid load cell** [9157-369]
R. Fiorin, Faculdades Integradas do Brasil (Brazil); L. N. da Costa, I. Abe, V. de Oliveira, A. Lohmann, H. J. Kalinowski, Univ. Tecnológica Federal do Paraná (Brazil)
- 9157 84 **Explosives sensing based on suspended core fiber coated with conjugated polymer** [9157-370]
F. Chu, Shanghai Univ. of Electric Power (China); G. Tsiminis, The Univ. of Adelaide (Australia); N. A. Spooner, The Univ. of Adelaide (Australia) and Defence Science and Technology Organisation (Australia); T. M. Monro, The Univ. of Adelaide (Australia)
- 9157 85 **Photonic crystal fiber based modal interferometer for refractive index sensing** [9157-395]
M. Deng, X. Sun, W. Huang, Chongqing Univ. (China); H. Wei, J. Li, Yangtze Optical Fibre and Cable Co., Ltd. (China)
- 9157 86 **Highly sensitive refractive index sensor based on two cascaded microfiber knots with Vernier effect** [9157-417]
Z. Xu, Q. Sun, W. Jia, Huazhong Univ. of Science and Technology (China); P. P. Shum, Huazhong Univ. of Science and Technology (China) and Nanyang Technological Univ. (Singapore); D. Liu, Huazhong Univ. of Science and Technology (China)
- 9157 87 **Highly sensitive temperature sensor based on D-shaped microfiber with high birefringence** [9157-419]
H. Luo, Q. Sun, Z. Xu, W. Jia, D. Liu, Huazhong Univ. of Science and Technology (China)
- 9157 88 **Functionalization of exposed core fibers with multiligand binding molecules for fluorescence based ion sensing** [9157-430]
R. Kostecki, S. Heng, H. Ebendorff-Heidepriem, A. D. Abell, T. M. Monro, The Univ. of Adelaide (Australia)

- 9157 89 **Hollow-core fiber based linear cavity ring-down spectroscopy for gaseous oxygen detection** [9157-434]
D. Munzke, M. Böhm, O. Reich, Univ. of Potsdam (Germany)
- 9157 8A **Sensing characteristics of long period gratings in hollow core fiber fabricated via electrode arc discharge** [9157-471]
A. Iadicicco, Univ. degli Studi di Napoli Parthenope (Italy); A. Cutolo, Univ. degli Studi del Sannio (Italy); S. Campopiano, Univ. degli Studi di Napoli Parthenope (Italy)
- 9157 8B **Measurement of temperature profile in fiber Bragg gratings using whispering gallery modes** [9157-504]
M. Delgado-Pinar, I. L. Villegas, A. Díez, J. L. Cruz, M. V. Andrés, Univ. de València (Spain)
- 9157 8C **Novel fiber Bragg grating sensor implemented in a polymer-core/silica-cladding hybrid optical fiber** [9157-505]
Z. Yan, H. Khashi, K. Zhou, L. Zhang, Aston Univ. (United Kingdom)
- 9157 8D **Relative humidity optical fiber sensors** [9157-524]
H.-B. Ni, M. Wang, W. Chen, Nanjing Normal Univ. (China)
- 9157 8E **Sensitive surface plasmon resonance biosensor enhanced by photonic-crystal metallic structure** [9157-533]
F. Wang, C. Chen, J. Fang, S. Peng, J. H. Yu, J. Zhang, J. Tang, H. Lu, Z. Chen, Y. Luo, Jinan Univ. (China)
- 9157 8F **A photonic crystal fibre tip refractometer based on multimode interference** [9157-537]
P. Wang, Dublin Institute of Technology (Ireland); M. Ding, Univ. of Southampton (United Kingdom); L. Bo, Y. Semenova, Dublin Institute of Technology (Ireland); G. Brambilla, Univ. of Southampton (United Kingdom); G. Farrell, Dublin Institute of Technology (Ireland)
- 9157 8G **Violet laser power sensor based on micro-fiber coated with methyl blue-functionalized reduced graphene oxide** [9157-538]
Z. Tian, J. Zhang, B. Yang, J. Yu, Z. Chen, J. Tang, Y. Luo, X. Cai, S. Tan, H. Lu, Jinan Univ. (China)
- 9157 8H **In-line photonic crystal fiber optofluidic refractometer** [9157-539]
C. Wu, Jinan Univ. (China); M.-L. V. Tse, Z. Liu, A. P. Zhang, The Hong Kong Polytechnic Univ. (Hong Kong, China); B.-O. Guan, Jinan Univ. (China); H.-Y. Tam, The Hong Kong Polytechnic Univ. (Hong Kong, China)
- 9157 8I **Radiation hardening of FBG in harsh environments** [9157-541]
A. Morana, Lab. Hubert Curien, CNRS, Univ. Jean Monnet (France) and Univ. degli studi di Palermo (Italy); S. Girard, Lab. Hubert Curien, CNRS, Univ. Jean Monnet (France); E. Marin, Lab. Hubert Curie, CNRS, Univ. Jean Monnet (France); C. Marcandella, CEA (France); J. Périsset, J. R. Macé, AREVA (France); A. Boukenter, Lab. Hubert Curien, CNRS, Univ. Jean Monnet (France); M. Cannas, Univ. degli Studi di Palermo (Italy); Y. Ouerdane, Lab. Hubert Curien, CNRS, Univ. Jean Monnet (France)

- 9157 8J **Label-free biosensor based on a dual-core transversally chirped microstructured optical fiber** [9157-552]
E. Reyes-Vera, N. Gómez-Cardona, Instituto Tecnológico Metropolitano (Colombia) and Univ. Nacional de Colombia Sede Medellín (Colombia); P. Torres, Univ. Nacional de Colombia Sede Medellín (Colombia)
- 9157 8K **Micro-electrodes system for electric field sensing with photonic liquid crystal fibers** [9157-580]
T. R. Woliński, M. Tefelska, S. Ertman, K. Mileńko, R. Łączkowski, A. Siarkowska, A. W. Domański, Warsaw Univ. of Technology (Poland)
- 9157 8L **High temperature sensor based on an in-fibre Fabry-Perot cavity** [9157-584]
O. Schneller, Heriot-Watt Univ. (United Kingdom) and Hochschule für Angewandte Wissenschaften München (Germany); J. Mathew, W. N. MacPherson, R. R. J. Maier, Heriot-Watt Univ. (United Kingdom)
- 9157 8M **Analysis of the air holes' geometry influence on longitudinal strain sensitivity of microstructured fiber Bragg gratings** [9157-585]
T. Tenderenda, K. Stepien, Military Univ. of Technology (Poland) and InPhoTech Ltd. (Poland); L. Szostkiewicz, InPhoTech Ltd. (Poland); M. Murawski, M. Szymanski, Military Univ. of Technology (Poland) and InPhoTech Ltd. (Poland); M. Becker, M. Rothhardt, H. Bartelt, Institut für Photonische Technologien e.V. (Germany); P. Mergo, K. Poturaj, K. Skorupski, Maria Curie-Skłodowska Univ. (Poland); P. Marć, L. R. Jaroszewicz, Military Univ. of Technology (Poland); T. Nasilowski, Military Univ. of Technology (Poland) and InPhoTech Ltd. (Poland)
- 9157 8N **Study of whispering gallery modes in a cylindrical microresonator excited by a tilted fiber taper** [9157-587]
V. Kavungal, L. Bo, Q. Wu, Dublin Institute of Technology (Ireland); M. Teng, C. Yu, Beijing Univ. of Posts and Telecommunications (China); G. Farrell, Y. Semenova, Dublin Institute of Technology (Ireland)
- 9157 8O **Delamination-diagnosis-method for adhesively surface-applied FBG strain sensors** [9157-604]
E. Baitinger, V. Schukar, N. Kusche, C. Schilder, Bundesanstalt für Materialforschung und -prüfung (Germany)
- 9157 8P **Improvement in refractive index sensitivity by means of internally curved long period fiber gratings** [9157-615]
F. Chiavaioli, C. Trono, F. Baldini, Istituto di Fisica Applicata Nello Carrara (Italy)
- 9157 8Q **Optical fiber hydrogen sensor based on polarization-maintaining photonic crystal fiber** [9157-624]
Y. Yang, F. Yang, H. Wang, X. Diao, Q. Liu, BeiHang Univ. (China)
- 9157 8R **Multiwavelength fiber lasers based on spatial mode beating for high resolution linear and angular displacement sensing** [9157-631]
N. K. Chen, Y.-H. Chang, National United Univ. (Taiwan); W.-H. Cheng, National Sun Yat-Sen Univ. (Taiwan); T.-H. Guo, B.-O. Guan, Jinan Univ. (China)

- 9157 8S **Optical fiber current transducer using lossy mode resonances for high voltage networks** [9157-568]
J. Ascorbe, J. M. Corres, I. R. Matias, F. J. Arregui, Univ. Pública de Navarra (Spain)
- 9157 8T **Microfiber coupler based biosensor incorporating a layer of gold nanoparticles with improved sensitivity** [9157-595]
Y. Semenova, L. Bo, P. Wang, F. Tian, H. Byrne, G. Farrell, Dublin Institute of Technology (Ireland)
- 9157 8U **Optical fiber Bragg grating mesh for multiphase flow sensing** [9157-671]
C. R. Zamarreño, Univ. Pública de Navarra (Spain); C. Martelli, V. H. V. Baroncini, E. N. dos Santos, M. J. da Silva, R. E. M. Morales, Univ. Tecnológica Federal do Paraná (Brazil); I. R. Matias, F. J. Arregui, Univ. Pública de Navarra (Spain)
- 9157 8V **Application of fiber Bragg grating sensors in light aircraft: ground and flight test** [9157-8]
J.-H. Kim, P. Shrestha, Y. Park, C.-G. Kim, KAIST (Korea, Republic of)
- 9157 8W **An oil and gas pipeline pre-warning system based on Φ -OTDR** [9157-14]
D. Tan, China Univ. of Petroleum-Beijing (China) and China National Petroleum Corp. (China); X. Tian, W. Sun, Y. Zhou, L. Liu, Y. Ma, J. Meng, China National Petroleum Corp. (China); H. Zhang, China Univ. of Petroleum-Beijing (China)
- 9157 8X **Fiber optical magnetic field sensor for power generator monitoring** [9157-31]
M. Willsch, T. Bosselmann, M. Villnow, Siemens AG (Germany)
- 9157 8Y **Raman distributed temperature sensor for oil leakage detection in soil: a field trial and future trends** [9157-39]
A. Signorini, T. Nannipieri, Scuola Superiore Sant'Anna (Italy); L. Gabella, Photonic Networks National Lab. (Italy); F. Di Pasquale, Scuola Superiore Sant'Anna (Italy); G. Latini, D. Ripari, Saipem S.p.A. (Italy)
- 9157 8Z **Fiber optic sensor for methanol quantification in biodiesel** [9157-54]
M. S. Kawano, R. Kamikawachi, J. L. Fabris, M. Müller, Univ. Tecnológica Federal do Paraná (Brazil)
- 9157 90 **Field test of a fully distributed fiber optic intrusion detection system for long-distance security monitoring of national borderline** [9157-100]
H. Wu, Z. Wang, F. Peng, Z. Peng, X. Li, Y. Wu, Y. Rao, Univ. of Electronic Science and Technology of China (China)
- 9157 91 **Optical fiber Fabry-Perot pressure sensor based on SU-8** [9157-106]
J. Zhu, L. Dai, M. Wang, D. Cai, H. Rong, S. Jia, J. You, Nanjing Normal Univ. (China)
- 9157 92 **In-service communication channel sensing based on reflectometry for TWDM-PON systems** [9157-129]
D. Iida, S. Kuwano, J. Terada, NTT Access Network Service Systems Labs. (Japan)
- 9157 93 **Refractive index and viscosity: dual sensing with plastic fibre gratings** [9157-154]
R. Ferreira, Univ. de Aveiro (Portugal); L. Bilro, C. Marques, R. Oliveira, R. Nogueira, Instituto de Telecomunicações (Portugal)

- 9157 94 **Production and characterization of Bragg gratings in polymer optical fibers for sensors and optical communications** [9157-176]
R. Oliveira, C. F. Marques, L. Bilro, R. N. Nogueira, Instituto de Telecomunicações (Portugal)
- 9157 95 **Noncontact photoacoustic tomography using optical fiber-based heterodyne interferometer** [9157-194]
J. Eom, S. J. Park, Y. H. Kim, Gwangju Institute of Science and Technology (Korea, Republic of); C. S. Lee, The Univ. of Suwon (Korea, Republic of); B. H. Lee, Gwangju Institute of Science and Technology (Korea, Republic of)
- 9157 96 **Investigation of low-cost two-wavelength interrogation for integration of different fiber optical temperature sensors into electric power facility monitoring systems** [9157-297]
M. Willsch, J. Kaiser, T. Bosselmann, Siemens AG (Germany); T. Wieduwilt, R. Willsch, Institut für Photonische Technologien e.V. (Germany)
- 9157 97 **FBG system for temperature monitoring under electromagnetic immersed and harsh oil and gas reservoir environment** [9157-319]
M. Villnow, T. Bosselmann, M. Willsch, J. Kaiser, Siemens AG (Germany)
- 9157 98 **A novel wireless mobile platform integrated with optical fibre sensors** [9157-325]
B. Zhou, S. Yang, T. Sun, K. T. V. Grattan, City Univ. London (United Kingdom)
- 9157 99 **Characterisation of radioluminescence based optical fibre dosimeter in radiotherapy beam applications** [9157-348]
P. Woulfe, Galway Clinic (Ireland) and Univ. of Limerick (Ireland); S. O'Keeffe, D. McCarthy, Univ. of Limerick (Ireland); M. Grattan, A. Hounsell, Belfast City Hospital (United Kingdom); J. Cronin, Galway Clinic (Ireland); E. Lewis, Univ. of Limerick (Ireland)
- 9157 9A **Field test of microbend fiber sensor for hospital use** [9157-371]
Z. Chen, Institute for Infocomm Research (Singapore); D. Lau, Singapore General Hospital (Singapore); J. T. Teo, S. H. Ng, X. Yang, Institute for Infocomm Research (Singapore); P. L. Kei, Singapore General Hospital (Singapore)
- 9157 9B **Performance of a 400km interrogated fiber optics hydrophone array** [9157-380]
C. Cao, S. Xiong, Q. Yao, Z. Hu, Y. Hu, National Univ. of Defense Technology (China)
- 9157 9C **Evaluation of Brillouin frequency shift and its temperature dependence in poly(pentafluorostyrene)-based polymer optical fibers by ultrasonic pulse-echo technique** [9157-386]
K. Minakawa, Tokyo Institute of Technology (Japan); K. Koike, Keio Univ. (Japan) and New York Univ. (United States); N. Hayashi, Tokyo Institute of Technology (Japan); Y. Koike, Keio Univ. (Japan); Y. Mizuno, K. Nakamura, Tokyo Institute of Technology (Japan)
- 9157 9D **Discriminative measurement of strain and temperature using Brillouin scattering and fluorescence in erbium-doped optical fiber** [9157-389]
M. Ding, Y. Mizuno, K. Nakamura, Tokyo Institute of Technology (Japan)
- 9157 9E **Long-gauge FBGs interrogated by DTR³ for dynamic distributed strain measurement of helicopter blade model** [9157-402]
M. Nishiyama, H. Igawa, T. Kasai, Japan Aerospace Exploration Agency (Japan); N. Watanabe, Tokyo Metropolitan Univ. (Japan)

- 9157 9F **Miniaturized total temperature probe based on fibre Bragg gratings** [9157-423]
L. Polz, T. Berghaus, M. Klose, Hochschule für Angewandte Wissenschaften München (Germany); A. Zeisberger, MTU Aero Engines (Germany); H. Bartelt, Institut für Photonische Technologien e.V. (Germany); J. Roths, Hochschule für Angewandte Wissenschaften München (Germany)
- 9157 9G **Magnetic field sensor utilizing bent fiber taper and magnetic fluid** [9157-448]
J. Li, Z. Tian, L.-P. Sun, B.-O. Guan, Jinan Univ. (China)
- 9157 9H **Radiation hard fiber optic thermo-hygrometers for relative humidity detection in the CMS experiment at CERN** [9157-467]
G. Berruti, Univ. degli Studi del Sannio (Italy) and CERN (Switzerland); M. Consales, Univ. degli Studi del Sannio (Italy); M. Giordano, Istituto per i Materiali Compositi e Biomedici. CNR (Italy); S. Buontempo, INFN, CNR (Italy); G. Breglio, Univ. degli Studi di Napoli Federico II (Italy); A. Makovec, The Univ. of Debrecen (Hungary); P. Petagna, CERN (Switzerland); A. Cusano, Univ. degli Studi del Sannio (Italy)
- 9157 9I **Fiber Bragg grating sensor as valuable technological platform for new generation of superconducting magnets** [9157-468]
A. Chiuchiolo, Univ. degli Studi del Sannio (Italy) and CERN (Switzerland); M. Bajko, J. C. Perez, H. Bajas, P. Viret, CERN (Switzerland); M. Consales, Univ. degli Studi del Sannio (Italy); M. Giordano, Istituto per i Materiali Compositi e Biomedici. CNR (Italy); G. Breglio, Univ. degli Studi di Napoli Federico II (Italy); A. Cusano, Univ. degli Studi del Sannio (Italy)
- 9157 9J **A mechanical filter for FBG accelerometers** [9157-482]
M. Boccione, G. Bucca, A. Collina, L. Comolli, Politecnico di Milano (Italy)
- 9157 9K **Wavelength domain multiplexed fiber specklegram sensor** [9157-498]
L. Rodriguez-Cobo, M. Lomer, A. Cobo, E. Real, J. M. Lopez-Higuera, Univ. de Cantabria (Spain)
- 9157 9L **FBG sensors for deformation monitoring of a tracking particle detector: preliminary results** [9157-526]
A. Iadicicco, Univ. degli Studi di Napoli Parthenope (Italy); M. Della Pietra, Univ. degli Studi di Napoli Parthenope (Italy) and INFN (Italy); S. Campopiano, Univ. degli Studi di Napoli Parthenope (Italy)
- 9157 9M **Research activities to push standardization of fibre optic strain sensors** [9157-553]
W. R. Habel, V. G. Schukar, F. Mewis, F. Basedau, Bundesanstalt für Materialforschung und -prüfung (Germany)
- 9157 9N **Fibre optic monitoring system for the determination of segment joint movements inside a hydro power dam** [9157-608]
H. Woschitz, F. Klug, W. Lienhart, Technische Univ. Graz (Austria)
- 9157 9O **Performance analysis simulation of new SPR microstructured D-type optical fiber sensor configurations for refractive index measurement** [9157-643]
D. F. Santos, Univ. da Madeira (Portugal) and INESC TEC (Portugal); A. Guerreiro, Univ. do Porto (Portugal) and INESC TEC (Portugal); J. M. Baptista, Univ. da Madeira (Portugal) and INESC TEC (Portugal)

- 9157 9P **Field test of the flow noise of fiber laser hydrophone array** [9157-661]
W. Zhang, W. Huang, Y. Luo, Z. Wang, F. Li, Institute of Semiconductors (China)
- 9157 9Q **Condition monitoring of a subsea pump using fibre optic sensing** [9157-664]
K. Jones, C. Staveley, J.-F. Vialla, Smart Fibres Ltd. (United Kingdom)
- 9157 9R **Structural health monitoring with fiber optic sensors** [9157-34]
A. Güemes, A. Fernandez-Lopez, Univ. Politecnica Madrid (Spain)
- 9157 9S **Monitoring the energy efficiency of buildings with Raman DTS and embedded optical fiber cables** [9157-91]
P. Ferdinand, M. Giuseffi, N. Roussel, S. Rougeault, Lab. de Mesures Optiques, CEA (France); O. Fléchon, V. Barentin, Lab. Energétique du Bâtiment, Parc Savoie Technolac (France)
- 9157 9T **High-resolution high-sensitivity and truly distributed optical frequency domain reflectometry for structural crack detection** [9157-111]
W. Li, X. Bao, L. Chen, Univ. of Ottawa (Canada)
- 9157 9U **A real-time inclinometer based on an etched fiber Bragg grating connected to hollow-core fiber** [9157-218]
Q. Zhang, T. Zhu, F. Yin, Chongqing Univ. (China); K. S. Chiang, City Univ. of Hong Kong (Hong Kong, China); M. Deng, Chongqing Univ. (China)
- 9157 9V **Reinforced concrete structural corrosion monitoring using Hi-Bi photonic crystal fibres in a fiber loop structure** [9157-292]
M. Bravo, Univ. Pública de Navarra (Spain); C. McCague, M. Fabian, City Univ. London (United Kingdom); L. Jaroszewicz, Military Univ. of Technology (Poland); P. Mergo, Maria Curie Skłodowska Univ. (Poland); M. Lopez-Amo, Univ. Pública de Navarra (Spain); K. T. V. Grattan, T. Sun, City Univ. London (United Kingdom)
- 9157 9W **Effects of elongation on polymer optical fiber power losses for sensing purposes** [9157-303]
D. S. Montero, J. C. Torres, J. Zahr-Viñuelas, J. L. Pérez Castellanos, C. Vázquez, Univ. Carlos III de Madrid (Spain)
- 9157 9X **Carbon fibre-foam sandwich composite laminate embedded with fiber Bragg grating sensors** [9157-383]
G. Rajan, E. Darminan, G.-D. Peng, G. Prusty, The Univ. of New South Wales (Australia)
- 9157 9Y **A flexible tactile sensitive sheet using a hetero-core fiber optic sensor** [9157-393]
S. Fujino, H. Yamazaki, A. Hosoki, K. Watanabe, Soka Univ. (Japan)
- 9157 9Z **Stabilization of fiber Bragg grating laser sensor with polarization scrambling** [9157-429]
H. Kim, D. Kim, M. Song, Chonbuk National Univ. (Korea, Republic of)
- 9157 A0 **Dynamic measurement of inside strain distributions in adhesively bonded joints by embedded fiber Bragg grating sensor** [9157-452]
H. Murayama, X. Ning, K. Kageyama, D. Wada, The Univ. of Tokyo (Japan); H. Igawa, Japan Aerospace Exploration Agency (Japan)

- 9157 A1 **In-situ measurements with fibre Bragg gratings embedded in stainless steel** [9157-528]
D. Havermann, J. Mathew, W. N. MacPherson, R. J. Maier, D. P. Hand, Heriot-Watt Univ. (United Kingdom)
- 9157 A2 **Fiber Bragg grating sensors for steel wire monitoring in real-time** [9157-536]
J. Koch, Fraunhofer Heinrich Hertz Institute (Germany) and Clausthal Univ. of Technology (Germany); M. Angelmahr, Fraunhofer Heinrich Hertz Institute (Germany); W. Schade, Fraunhofer Heinrich Hertz Institute (Germany) and Clausthal Univ. of Technology (Germany)
- 9157 A3 **Fiber Bragg grating spectral features for structural health monitoring of composite structures** [9157-564]
S. Webb, K. Peters, M. Zikry, North Carolina State Univ. (United States); N. Stan, S. Chadderdon, R. Selfridge, S. Schultz, Brigham Young Univ. (United States)
- 9157 A4 **Fibre optic humidity sensor designed for highly alkaline environments** [9157-573]
K. Bremer, M. Wollweber, Leibniz Univ. Hannover (Germany); S. Guenther, G. Werner, Fibotec Fiberoptics GmbH (Germany); T. Sun, K. T. V. Grattan, City Univ. London (United Kingdom); B. Roth, Leibniz Univ. Hannover (Germany)
- 9157 A5 **Comparison of three different configurations of an optical sensor for tip-clearance measurements in turbines** [9157-578]
I. García, J. Zubia, A. Berganza, Univ. del País Vasco (Spain); J. Beloki, CTA-Aeronautical Technologies Ctr. (Spain); J. Mateo, Univ. de Zaragoza (Spain); C. Vazquez, Univ. Carlos III de Madrid (Spain)
- 9157 A6 **Deformation monitoring in prestressing tendons using fibre Bragg gratings encapsulated in metallic packages** [9157-583]
G. Fusiek, M. Perry, P. Niewczas, Univ. of Strathclyde (United Kingdom); M. Johnston, EDF Energy plc (United Kingdom)
- 9157 A7 **Coating process of Fiber Bragg Grating sensors for SHM applications in metallic structures** [9157-617]
E. Piñeiro, T. Grandal, A. Asensio, F. Rodriguez, Asociación de Investigación Metalúrgica del Noroeste (Spain)
- 9157 A8 **An acoustic vibration sensor based on tapered triple cladding fiber** [9157-22]
H. Xu, F. Pang, S. Zhao, Z. Chen, T. Wang, Shanghai Univ. (China)
- 9157 A9 **High sensitivity high temperature sensor based on SMS structure with large-core all-solid bandgap fiber as the multimode section** [9157-48]
M. A. R. Franco, A. L. S. Cruz, Instituto de Estudos Avançados (Brazil) and Instituto Tecnológico de Aeronáutica (Brazil); V. A. Serrão, C. L. Barbosa, Instituto de Estudos Avançados (Brazil)
- 9157 AA **Simulated Pitot tube designed to detect blockage by ice, volcanic dust, sand, insects and to clear it: phase 1** [9157-63]
D. A. Jackson, Univ. of Kent (United Kingdom)

- 9157 AB **Simultaneous measurement of strain and temperature using a unique LPG-coupled fibre laser scheme** [9157-119]
D. Leandro, Univ. Pública de Navarra (Spain); M. Ams, City Univ. London (United Kingdom); M. López-Amo, Univ. Pública de Navarra (Spain); T. Sun, K. T. V. Grattan, City Univ. London (United Kingdom)
- 9157 AC **Tuning the SMS spectrum based on UV radiation** [9157-121]
D. Zhong, Y. Tian, J. Zhang, W. Sun, L. Yuan, Harbin Engineering Univ. (China)
- 9157 AD **Interferometric displacement sensor by use of a single-passband incoherent microwave photonics filter** [9157-135]
C. R. Fernández-Pousa, H. Maestre, P. Corral, Univ. Miguel Hernández (Spain)
- 9157 AE **Fiber powered sensing system for a long reach single mode fiber link and non-continuous applications** [9157-137]
J. B. Rosolem, F. R. Bassan, F. R. Pereira, R. S. Penze, A. A. Leonardi, CPqD (Brazil); C. A. M. Nascimento, CEMIG Distribution (Brazil)
- 9157 AF **1×N optical fiber coupler based on a polyhedral gradient index lens** [9157-145]
Y. Yang, W. Dai, K. Song, BeiHang Univ. (China); W. Jin, BeiHang Univ. (China) and The Hong Kong Polytechnic Univ. (Hong Kong, China)
- 9157 AG **Characterisation of effective mode-field diameter of coupled multi-core fibre** [9157-156]
K. Nakajima, K. Saito, Y. Goto, C. Fukai, T. Kurashima, Nippon Telegraph and Telephone Corp. (Japan)
- 9157 AH **Design for a new fiber optic interferometer of water cut meter in oil well logging** [9157-172]
Y. Shang, X. Liu, C. Wang, W. Zhao, Laser Institute, Shandong Academy of Sciences (China) and Key Lab. of Optical Fiber Sensing Technology of Shandong Province (China)
- 9157 AI **First observation of fiber fuse phenomenon in polymer optical fibers** [9157-173]
Y. Mizuno, N. Hayashi, H. Tanaka, K. Nakamura, Tokyo Institute of Technology (Japan); S. Todoroki, National Institute for Materials Science (Japan)
- 9157 AJ **Viscoelastic tuning of fibre Bragg gratings during regeneration** [9157-186]
J. Canning, The Univ. of Sydney (Australia); S. Gao, The Univ. of Sydney (Australia) and Zhejiang Univ. (China); K. Cook, The Univ. of Sydney (Australia); A. Loubert, The Univ. of Sydney (Australia) and ICMMO, CNRS, Univ. Paris Sud 11 (France); M. Lancry, ICMMO, CNRS, Univ. Paris-Sud 11 (France)
- 9157 AK **High-stability double-pass backward erbium-doped superfluorescent photonic crystal fiber source** [9157-189]
S. Ruan, X. Wu, C. Liu, L. Zhang, Shenzhen Univ. (China)
- 9157 AL **Performance analysis of the sweep-free Brillouin optical time-domain analyzer (SF-BOTDA)** [9157-450]
A. Voskoboinik, A. E. Willner, Univ. of Southern California (United States); M. Tur, Tel-Aviv Univ. (Israel)
- 9157 AM **Real-time fast and distributed measurement of a Brillouin-inhomogeneous fiber using tailored-frequency probe in slope-assisted BOTDA** [9157-515]
O. Danon, A. Motil, I. Sovran, R. Hadar, M. Tur, Tel-Aviv Univ. (Israel)

SENSOR APPLICATION AND NEW TECHNIQUES

- 9157 AN **Next generation of optical fibre sensors: new concepts and perspectives (Invited Paper)**
[9157-683]
L. Thévenaz, Ecole Polytechnique Fédérale de Lausanne (Switzerland)
- 9157 AO **Microwave photonics filtering technique for interrogating long weak fiber Bragg grating sensors** [9157-490]
A. L. Ricchiuti, D. Barrera, S. Sales, Univ. Politècnica de València (Spain); L. Thévenaz, Ecole Polytechnique Fédérale de Lausanne (Switzerland); J. Capmany, Univ. Politècnica de València (Spain)
- 9157 AP **Palladium coated ball lens for optical fibre refractometry based hydrogen sensing**
[9157-545]
S. A. Chowdhury, R. Correia, D. Francis, Cranfield Univ. (United Kingdom); S. J. Brooks, B. J. S. Jones, A. W. J. Thompson, AWE plc (United Kingdom); J. Hodgkinson, R. P. Tatam, Cranfield Univ. (United Kingdom)
- 9157 AQ **Advanced photonic vortex flowmeter with interferometer sensor for measurement of wide dynamic range of medium velocity at high temperature and high pressure** [9157-619]
H. Krisch, KROHNE Messtechnik GmbH (Germany); B. Niermann, A. Gedikli, KROHNE Innovation GmbH (Germany); T. Tenderenda, T. Nasilowski, Military Univ. of Technology (Poland) and InPhoTech Ltd. (Poland)
- 9157 AR **Vibration sensor based on highly birefringent Bragg gratings written in standard optical fiber by a femtosecond laser** [9157-672]
K. Chah, A. Bueno, D. Kinet, C. Caucheteur, C. Chluda, P. Mégret, M. Wuilpart, Univ. de Mons (Belgium)

SPECIAL SESSION II: THREE DECADES OF THE OFS SERIES

- 9157 C2 **30 Years of the OFS Conference: the origins and directions of our subject (Invited Paper)**
[9157-688]
J. D. C. Jones, Heriot-Watt Univ. (United Kingdom)

SPECIAL SESSION III: NEW PHOTONIC SENSING CONCEPTS FOR A HEALTHIER AND MORE SECURE WORLD

- 9157 C3 **Towards 1'000'000 resolved points in a distributed optical fibre sensor (Invited Paper)**
[9157-685]
M. A. Soto, L. Thévenaz, Ecole Polytechnique Fédérale de Lausanne (Switzerland)
- 9157 C4 **Optical fiber sensing in the oil and gas industry: overcoming challenges (Invited Paper)**
[9157-686]
C. Baldwin, Weatherford (Australia)

- 9157 C5 **Development and application of Raman-probes for biomedical diagnosis and environmental monitoring (Invited Paper)** [9157-689]
J. Popp, Institute of Physical Chemistry and Abbe Ctr. of Photonics (Germany) and Leibniz Institute of Photonic Technology (Germany)
- 9157 C6 **Optical current sensors in the modernization of the electric power grid: digital substation challenges (Invited Paper)** [9157-687]
J. N. Blake, A. H. Rose, Alstom Grid Inc. (United States)

Author Index

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Introduction

The International Conference on Optical Fibre Sensors (OFS) was first held in London, in 1983. Since then, it has become established as the leading forum for the delivery of new research in optical fibre and guided-wave-based optical systems for sensing, instrumentation and imaging, as well as their applications in physical, chemical and biological measurement. Nowadays OFS is acknowledged as the world's leading interdisciplinary conference on all topics related to photonic sensing with an emphasis on those enabled by optical waveguides and especially by optical fibres.

OFS provides a vibrant forum for reporting the latest advances in fibre-optic and photonic sensing technologies and related devices. The conference has also fostered the exchange of knowledge and ideas within the research and industrial communities. The conference series is held every eighteen months, in rotation between the Americas, Europe, and Asia and the Pacific.

In 2014, OFS will be held in Spain for the first time. OFS23 will be held from Monday to Friday, 2–6 June, in Santander, Cantabria. The conference has now passed three decades and shows every sign of continuing to grow in importance and popularity.

The OFS community is exceptionally heterogeneous. It is not 'owned' by a particular scientific or engineering society, but is stewarded by its own International Steering Committee. Conference participants are highly diverse, and come from a wide range of disciplines in physical sciences and engineering and, to an increasing extent, from life sciences as well. Perhaps it is, above all, the intrinsic interdisciplinarity that keeps the Conference relevant and attractive to many around the world. After all, none of the really important global problems today have solutions lying within a single academic discipline; therefore, we believe that the OFS community is uniquely positioned to contribute to their understanding and definition of viable and sustainable solutions.

Prof. Alan Rogers has been a leading figure in our subject since its inception, and his recent death is a sad loss to the community. OFS23 will recognise his generous and outstanding contributions in a special session (Tribute to Alan Rogers) and by naming one of the Best Student Paper Awards after him: the Alan Rogers Best Student Paper Award on distributed sensors and sensor networks.

A glance at the programme for OFS23 emphatically confirms the reality of the increasing need for more sophisticated sensors and larger sensing networks to address the world's most topical and pervasive problems: of energy, environment, sustainability and health. The programme of the Conference shows the optical sensing community's commitment to tackling such challenges, including examples such as the generation and distribution of electrical energy, energy storage and

energy efficiency, monitoring of environments whether natural or engineered, transport infrastructures and manufacturing. Also, exciting progress is evident at the interface between physical sciences and the life sciences: where optical fibre sensors are becoming an essential component of the new subject of biophotonics—that is becoming established as an invaluable tool for R&D in biochemistry and medicine.

OFS sustains its position at the leading edge of its subject; it continues to evolve to incorporate new science, novel concepts and technologies, advanced techniques and methodologies, combined to achieve more effective, efficient, and economical sensing based on light. This conference series has undergone considerable evolution and healthy growth over the years, reaching now its 23rd occasion, which can already be considered a success in respect of the number of submitted contributions (535), an absolute record in the history of the Conference.

During OFS23, a total of 401 papers will be presented and discussed, 68 in oral and 333 in poster format. After a first review process (with 4 reviews per paper) 375 high quality papers from 35 countries have been accepted. In addition, another six postdeadline papers will be accepted for presentation at OFS23 in a second review process. It must be also remarked that the Conference attendees will have the opportunity to enjoy 20 invited presentations from worldwide leading researchers, with 3 of them as plenary talks of one hour each, delivered by highly renowned scientists from leading Institutions.

OFS is only ever as good as the quality of the papers presented, and we are grateful to all of our authors for their excellent contributions. Moreover, we would particularly like to thank our Technical Programme Committee, which has undertaken the onerous task of carefully reading and assessing all the submissions, and has been consistently diligent and reliable in providing the advice on which the programme has been built. Also to be recognised is that in OFS23, due to the large number of submissions received, the contribution of many members of the International Steering Committee and International Honorary Committee has been crucial to ensure a full review of all submissions: thus satisfying the general OFS23 principle of a minimum of four reviewers per paper. This was indeed a collective endeavour that we deeply appreciate and acknowledge.

OFS23 has been organized during a period of deep economic crisis in Europe with strong impact in Spain, making the many challenges of organising a large complex international conference even more acute. Within this context, we are especially appreciative of the support of companies and institutions that have generously sponsored the Conference, representing a key contribution enabling us to achieve the high quality to which we have aspired for OFS23. Thank you!

We are grateful to all staff of the conference office for their hard work and enthusiasm, in particular we would like to thank Jesus Mirapeix, Ana Maria Ruiz, and

Jose Valdiande at the Photonics Engineering Group and the SPIE staff for their effective and indefatigable dedication.

To SPIE, we would like to record our appreciation for their advice and technical skills in the editing and production of the Proceedings of OFS23.

Whatever your reasons for joining OFS-23, we are delighted to welcome you to the city of Santander and to wish you an enjoyable and successful Conference.

José Miguel López-Higuera
Julian Jones
Manuel López-Amo
José Luis Santos

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NanoPhotonics: pushing sensing to its limits in size and speed

Prof. Dr. Niek van Hulst

*ICFO – the Institute of Photonic Sciences and
ICREA – Institució Catalana de Recerca i Estudis Avançats,
Spain*

Abstract:

Optical fibres are historically at the base of near-field optics for nanoscale sensing and microscopy, opening routes to the detection of single molecules, quantum dots, protein complexes, etc. Fibres with conventional sub-wavelength aperture however are inefficient; while fixtures with plasmonic nano-antenna probes are highly superior for light control on the nanoscale. In this presentation I will focus on optical control, both in space and time, by resonant nanoantennas and phase shaped fs pulses.

For spatial control, we manipulate single photon emitters close to optical antennas (monopole dipole, multipole and multi element) to explore nanoscale field concentration, directionality, spectral resonances and sensing applications. Exploiting resonant antenna designs the emission can be enhanced up to 1000 times and steered into narrow forward angular cones.

For temporal control, we exploit phase shaped fs pulses to drive resonant antennas and single quantum systems to dynamically control both their fs response and nanoscale fields. Both amplitude and optical phase of antennas is directly captured. Interestingly when applied to single-molecules and even molecular antenna complexes a superior degree of coherent control beyond the ensemble is realized..

In conclusion, with this presentation I hope to provide insight on the advances and potential of modern photonics at the cross-roads between nm and fs scales.

This work is supported by ERC-Advanced Grant 247330 on NanoAntennas, MICINN Consolider CSD2007-046, Fundació CELLEX Barcelona and LASERLAB-EUROPE.

Novel light-based technologies for biomedical applications

Prof. Dr. Seok-Hyun Yun

Harvard Medical School-Wellman Center for Photomedicine
Harvard-MIT Health Sciences and Technology, United States

Abstract:

Upon absorption of a photon, molecules can be excited or altered, triggering various photochemical events useful for sensing and therapy. The light-induced processes are thermodynamically robust because of high activation energy, and are energy-efficient because downstream biochemical events may amplify their biological effects. Numerous techniques based on photochemical processes have been developed, such as photodynamic therapy and optogenetics. Despite the great promise of the light-based techniques in medicine, a major common challenge has been the difficulty of delivering light deep into the tissue. Owing to intrinsic absorption and scattering, the penetration depth of light is no more than several mm's in tissue. To date, the clinical use of optical techniques has been limited to superficial layers, such as the skin and retina, or the epithelial surfaces of organs that are accessible by catheters or endoscopes. In this talk, I will present some of the novel, nonconventional, intriguing approaches that have a potential to solve the problem of light delivery, using the concepts originally developed in optical fiber sensor community and employing polymers and cells as biocompatible photonic materials.

Quantum technologies for sensing, metrology and imaging

Prof. Dr. Jonathan P. Dowling

Theoretical Physics, Hearne Institute for Theoretical Physics
Louisiana State University, United States

Abstract:

Over the past 20 years bright sources of entangled photons have led to a renaissance in quantum optical interferometry. These photon sources have been used to test the foundations of quantum mechanics and implement some of the spooky ideas associated with quantum entanglement such as quantum teleportation, quantum cryptography, quantum lithography, quantum computing logic gates, and sub-shot-noise optical interferometers. I will discuss some of these advances and the unification of optical quantum imaging, metrology, and sensing via the common language of quantum optical information processing. In particular I will discuss ways to exploit quantum optical entanglement to beat the Rayleigh diffraction limit in imaging systems such as in microscopes, LIDAR, and optical lithography. I will also discuss how this entanglement can be used to beat the shot noise limit, for example in fiber optical gyroscopes, as well as to the sensing of biological or chemical targets.

INVITED PAPER ABSTRACTS

Given that the following papers were not available at the time of publication, their three associated abstracts have been included.

Three decades of optical fiber sensors commercialization: dawn, present and future

Alexis Mendez, MCH Engineering LLC (United States)

Over the past three decades, fiber optic sensors (FOS) have made a complete transition from basic lab prototypes to successful commercial products. A broad variety of commercial sensors and instruments are nowadays readily available, which enjoy increased acceptance and widespread use in different fields and industries. FOS solutions are commonly used in real-life applications ranging from structural sensing and health monitoring of materials and structures; to downhole pressure and temperature sensors for oil and gas reservoir monitoring; to high voltage and high current sensing systems for the power industry; to biomedical patient devices—among others. The commercialization road has been slow-moving and rocky at times, but always progressive and dotted with multiple successful companies and products.

This talk will provide a historical overview of FOS technology evolution and its associated commercialization efforts over the past 30 years. A historical summary will be made of the early FOS players and products, key present success stories and milestones, and envisioned future prospects. The main goal is to contrast the historical past trajectory against the maturity of its present market and future commercial outlook.

Nanoscale sensing using optical fibres: new photonic architectures and surface functionality enabling novel sensors

Tanya Monro, The Univ. of Adelaide (Australia)

Optical glasses and fibres can be imbued with the properties of nanomaterials, and fibres can be structured with features spanning from 0.02–20 microns. Adding in surface chemistries that offer molecular recognition, one can create sensors to detect specific small molecules or proteins. Emerging sensing architectures will be presented including dip sensors that operate on volumes comparable to a single cell, the detection of single nanocrystals from a distance and fibre-tip sensors.

Direct laser writing in fiber: cladding photonics, optofluidic sensing, and smart catheters

Peter Hermann, Univ. of Toronto (Canada)

The manipulation of femtosecond laser light inside transparent media can be directed on varying interaction pathways to open new directions for creating dense memory storage, three-dimensional (3D) optical circuits, 3D microfluidic networks and high-speed scribing tracks. The presentation follows these fundamental interactions towards controlling glass processes in optical fibers that enable highly functional and compact devices to form with the benefits of seamless integration with single mode optical fibers. 3D optical circuits are formed within the fiber cladding that couple efficiently with the fiber core waveguide while chemical etching of laser-generated nanogratings is further applied to open microfluidic channels and optical resonator components for building into 3D opto-fluidic microsystems. Such all-fiber microsystems offer reduced fabrication and packaging costs for enabling more compact and integrated approaches in telecommunication, fiber laser, sensing, lab-in-fiber, smart medical catheter and biomedical probing device.