2023 International Workshop on Fiber Optics on Access Networks (FOAN 2023)

Gent, Belgium 30-31 October 2023



IEEE Catalog Number: CFP2396V-POD **ISBN:**

979-8-3503-1937-8

Copyright © 2023 by the Institute of Electrical and Electronics Engineers, Inc. All Rights Reserved

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

*** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.

IEEE Catalog Number:	CFP2396V-POD
ISBN (Print-On-Demand):	979-8-3503-1937-8
ISBN (Online):	979-8-3503-1936-1

Additional Copies of This Publication Are Available From:

Curran Associates, Inc 57 Morehouse Lane Red Hook, NY 12571 USA Phone: (845) 758-0400 Fax: (845) 758-2633 E-mail: curran@proceedings.com Web: www.proceedings.com



2023 International Workshop on Fiber Optics on Access Networks (FOAN)

Sensors and Sensor Networks

A Self-Contained IoT Sensor Module for Realizing Drastic Cost Reduction Hideaki Kimura (Chubu University, Japan), Tomoya Sugiyama (Chubu University, Japan), Momona Kikuzawa (Chubu University, Japan)

Sensors and Sensor Networks

Use of Fiber Optic Link for Phase-Noise Measurement	
Andrej Lavrič (University of Ljubljana, Slovenia), Bostjan Batagelj (University of Ljubljana, Slovenia)	4
Negative Curvature Hollow-Core Photonic Crystal Fibers Sensitivity to Acoustic Vibration in the Audible Spectrum	
Petr Dejdar (Brno University of Technology, Czech Republic), Ondřej Mokrý (Brno University of Technology, Czech Republic), Petr Munster (Brno University of Technology, Czech Republic), Tomas Horvath (Brno University of Technology, Czech Republic), Tomas Horvath (Brno University of Technology, Czech	
Republic), Adrian Tomasov (Brno University of Technology, Czech Republic), Ali A. Jasim (Czech Academy of Sciences, Czech Republic), Ondřej Podrazký (Czech	
Academy of Sciences, Czech Republic), Andrei Borodkin (Czech Academy of Sciences, Czech Republic), Pavel Honzatko (Institute of Photonics and Electronics,	
Czech Republic)	8
Theoretical and Practical Bounds on the Initial Value of Clock Skew Compensation Algorithm Immune to Floating-Point Precision Loss for Resource-Constrained Wireless Sensor Nodes	
Seungyeop Kang (Imperial College London, United Kingdom (Great Britain)), Kyeong Soo Kim (Xi'an Jiaotong-Liverpool University, China)	. 12
A Remote Reflecting Fiber Optic Method for Detecting Liquid Occurrences Over a Distance of 3 Kilometres	
Edvin Skaljo (University of Sarajevo, Bosnia and Herzegovina), Aljo Mujčić (University of Tuzla, Bosnia and Herzegovina), Anis Maslo (University of Sarajevo ETF	
& BH Telecom, Bosnia and Herzegovina)	. 17
Spatial Hole Burning in Reflective Semiconductor Optical Amplifier: Numerical Analysis From the Standpoint of Classical Electromagnetism	
Hovik Baghdasaryan (National Polytechnic University of Armenia, Armenia), Tamara M. Knyazyan (National Polytechnic University of Armenia, Armenia), Tamara	
Hovhannisyan (National Polytechnic University of Armenia, Armenia), Gurgen Mardoyan (State Engineering University of Armenia, Armenia), Marian Marciniak	
(National Institute of Telecommunications, Poland), Tigran Baghdasaryan (Vrije Universiteit Brussel, Belgium)	23

On - line

Free Space Optical Channel Estimation Based on Deep Learning Algorithms

OPTICAL AND ACCESS NETWORKS

Demonstration of a Real-Time 100G Ethernet Space Division Multiplexing PON Using a Weakly Coupled Multicore Fiber Sarah Cwalina (Fraunhofer Heinrich Hertz Institute, Germany), Sepideh Mohammadi Kouhini (Fraunhofer Henrich Hertz Institute, Germany), Kai Habel (Fraunhofer HHI, Germany), Volker Jungnickel (Fraunhofer Heinrich Hertz Institute & Technische Universität Berlin, Germany), Ronald Freund (HHI Fraunhofer, Germany)

Optical and Access Networks

Multiplexing Multi-Gbps Analog Radio-Over-Fiber Links Over a Converged Fiber/FSO Intra-Campus Infrastructure

Konstantina Kanta (National Technical University of Athens, Greece), Nikolaos Lyras (National Technical University of Athens, Greece), Argiris Ntanos (National Technical University of Athens, Greece), Aristeidis Stathis (National Technical University of Athens & Institute of Communications & Computer Systems, Greece), Panagiotis Toumasis (National Technical University of Athens, Greece), Efstathios Andrianopoulos (National Technical University of Athens, Greece), Christos Tsokos (National Technical University of Athens, Greece), Giannis Giannoulis (National Technical University of Athens, Greece), Dimitrios Apostolopoulos (National Technical University of Athens & Institute of Communication and Computer Systems, Greece), Hercules Avramopoulos (National Technical University of Athens, Greece)

Passive Center-To-Clustered Edge Nodes Networks Using Thin-Filter Flaced Wavelength Routers	
Kimio Oguchi (National Taiwan University of Science and Technology, Taiwan), Bo-Shen Yang (National Taiwan University of Science and Technology, Taiwan), Chi-Chia Chung (National Taiwan University of Science and Technology, Taiwan)	41
Eavesdropping Vulnerabilities in Optical Fiber Networks: Investigating Macro-Bending-Based Attacks Using Clip-On Couplers	
Vladimir Spurny (Brno University of Technology, Czech Republic), Petr Dejdar (Brno University of Technology, Czech Republic), Adrian Tomasov (Brno	
University of Technology, Czech Republic), Petr Munster (Brno University of Technology, Czech Republic), Tomas Horvath (Brno University of Technology, Czech Republic)	47
Stabilized Dispersion-Robust Millimeter-Wave Anything-Over-Fiber Transmitter in Access Networks Featuring a Double Sideband Suppressed Carrier Modulation	
Kristjan Vuk Baliz (University of Ljubljana, Slovenia), Bostjan Batagelj (University of Ljubljana, Slovenia)	52
Effect of Macrobends on the Transmission Parameters of a High-Speed Coherent System	
Vladimir Spurny (Brno University of Technology, Czech Republic), Adrian Tomasov (Brno University of Technology, Czech Republic), Pavel Záviška (Brno	
University of Technology, Czech Republic), Petr Dejdar (Brno University of Technology, Czech Republic), Petr Munster (Brno University of Technology, Czech Republic), Tomas Horvath (Brno University of Technology, Czech Republic)	57
University of Technology, Czech Republic), Petr Dejdar (Brno University of Technology, Czech Republic), Petr Munster (Brno University of Technology, Czech	57

Additional Papers

Fiber Bragg Grating Based Optical Sensor: From Its Sensing Principle Towards Industrial Applications JY. Huang	67
Hybrid-Mode Distributed Fiber Sensing with Multiple Parameters Monitoring Ability SK. Liaw, Z. Wang, YE. Zou, CY. Guo	68
Access Network Optimization: Impacts of Rising Energy Prices and Volume of Data Traffic G. Penko	69
Where HFC Stands in Today's Access World: A Comparison with PON, with Systems Engineering Approach J. Ratkoceri	70
3D Printing of Fiber and Waveguide Coupling Components in Polymer T. Baghdasaryan, K. Vanmol, F. Berghmans, H. Thienpont, J. Van Erps	71
NIS2 Impact on ELectronic Communications Networks Providers C. Almagro	72
Specialty Optical Fibers for Advanced Sensing Applications G. Keiser	
Heterogenous Photonic Integration for Quantum Optical CommunicationJ. Krc, A. Debevc, M. Ljubotina, M. Topic, I. Lufungula, J. De Witte, L. Midolo, C. Pedersen,A. Ghadimi, H. Sattari, M. Despont, S. Ferrari, W. Pernice, D. Van Thourhout	74
ONU Interconnection for Reducing Latency in TWDM-PON Based Mobile Front - and Middle- Hauls by Using Wavelength Mobility SL. Lee	75