

Networks and
Switching

Systems and
Subsystems

Fibers and Cables

Active Components

Passive Components

Integrated Optics

Optoelectronics

Sensors

Theory

Journal of

Lightwave Technology

This Print Collection Contains the Following Issues:

March 1, 2016	Volume 34	Number 5	JLTEDG
March 15, 2016	Volume 34	Number 6	
April 1, 2016	Volume 34	Number 7	
April 15, 2016	Volume 34	Number 8	



For the March 1, 2016 issue, see p. 1405 for the Table of Contents.
 For the March 15, 2016 issue, see p. 1433 for the Table of Contents.
 For the April 1, 2016 issue, see p. 1565 for the Table of Contents.
 For the April 15, 2016 issue, see p. 1651 for the Table of Contents.

Journal of Lightwave Technology

A JOINT IEEE / OSA PUBLICATION

APRIL 15, 2016

VOLUME 34

NUMBER 8

JLTEDG

(ISSN 0733-8724)

Top-Scored

Demonstration of Cladding-Pumped Six-Core Erbium-Doped Fiber Amplifier (<i>Top-Scored</i>) . . . H. Chen, N. K. Fontaine, R. Ryf, C. Jin, B. Huang, K. Shang, R.-J. Essiambre, L. Wang, T. Hayashi, T. Nagashima, T. Sasaki, Y. Messaddeq, and S. LaRochelle	1654
Orbital-Angular-Momentum Polarization Mode Dispersion in Optical Fibers (<i>Top-Scored</i>) L. Wang, P. Vaity, S. Chatigny, Y. Messaddeq, L. A. Rusch, and S. LaRochelle	1661
50 μm Multimode Fibers for Mode Division Multiplexing (<i>Top-Scored</i>) P. Sillard, D. Molin, M. Bigot-Astruc, A. Amezcua-Correa, K. de Jongh, and F. Achten	1672
Low Power InP-Based Monolithic DFB-Laser IQ Modulator With SiGe Differential Driver for 32-GBd QPSK Modulation (<i>Top-Scored</i>) S. Lange, N. Wolf, M. Gruner, L. Yan, R. Kaiser, K.-O. Velthaus, J. H. Choi, and M. Schell	1678
High Speed Direct Modulation of a Heterogeneously Integrated InP/SOI DFB Laser (<i>Top-Scored</i>) A. Abbasi, C. Spatharakis, G. Kanakis, N. S. André, H. Louchet, A. Katumba, J. Verbist, H. Avramopoulos, P. Bienstman, X. Yin, J. Bauwelinck, G. Roelkens, and G. Morthier	1683
A Hybrid Barium Titanate–Silicon Photonics Platform for Ultraefficient Electro-Optic Tuning (<i>Top-Scored</i>) S. Abel, T. Stöferle, C. Marchiori, D. Caimi, L. Czornomaz, M. Stuckelberger, M. Sousa, B. J. Offrein, and J. Fompeyrine	1688
Engineered Transfer Function InP Mach–Zehnder Modulator for Bandwidth Enhancement and Nyquist Shaping (<i>Top-Scored</i>) A. Aimone, G. Fiol, M. Gruner, and M. Schell	1694
Athermal Operation of a Waveguide Optical Isolator Based on Canceling Phase Deviations in a Mach–Zehnder Interferometer (<i>Top-Scored</i>) K. Furuya, T. Nemoto, K. Kato, Y. Shoji, and T. Mizumoto	1699
40 Gb/s WDM Transmission Over 1.15-km HC-PBGF Using an InP-Based Mach-Zehnder Modulator at 2 μm (<i>Top-Scored</i>) M. U. Sadiq, H. Zhang, J. O’Callaghan, B. Roycroft, N. Kavanagh, K. Thomas, A. Gocalinska, Y. Chen, T. Bradley, J. R. Hayes, Z. Li, S.-U. Alam, F. Poletti, M. N. Petrovich, D. J. Richardson, E. Pelucchi, P. O’Brien, F. H. Peters, F. Gunning, and B. Corbett	1706
Compact and Low-Loss ZrO ₂ -SiO ₂ PLC-Based 8 \times 8 Multicast Switch for CDC-ROADM Application (<i>Top-Scored</i>) M. Takahashi, S. Yamasaki, Y. Uchida, and J. Hasegawa	1712
4 Tb/s Transmission Reach Enhancement Using 10 \times 400 Gb/s Super-Channels and Polarization Insensitive Dual Band Optical Phase Conjugation (<i>Top-Scored</i>) A. D. Ellis, M. Tan, Md A. Iqbal, M. A. Z. Al-Khateeb, V. Gordienko, G. S. Mondaca, S. Fabbri, M. F. C. Stephens, M. E. McCarthy, A. Perentos, I. D. Phillips, D. Lavery, G. Liga, R. Maher, P. Harper, N. Doran, S. K. Turitsyn, S. Sygletos, and P. Bayvel	1717

(Contents Continued on Page 1652)

JOURNAL OF LIGHTWAVE TECHNOLOGY (ISSN 0733-8724) is published semimonthly by the Institute of Electrical and Electronics Engineers, Inc. Responsibility for the contents rests upon the authors and not upon the IEEE, the Society/Council, or its members. **IEEE Corporate Office:** 3 Park Avenue, 17th Floor, New York, NY 10016-5997. **IEEE Operations Center:** 445 Hoes Lane, Piscataway, NJ 08854-4141. **NJ Telephone:** +1 732 981 0060. **Price/Publication Information:** Individual copies: IEEE Members \$20.00 (first copy only), nonmembers \$427.00 per copy. (Note: Postage and handling charge not included.) Member and nonmember subscription prices available upon request. Available in microfiche and microfilm. **Copyright and Reprint Permissions:** Abstracting is permitted with credit to the source. Libraries are permitted to photocopy for private use of patrons, provided the per-copy fee of \$31.00 is paid through the Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923. For all other copying, reprint, or republication permission, write to Copyrights and Permissions Department, IEEE Publications Administration, 445 Hoes Lane, Piscataway, NJ 08854-4141. Copyright © 2016 by the Institute of Electrical and Electronics Engineers, Inc. All rights reserved. **Postmaster:** Send address changes to JOURNAL OF LIGHTWAVE TECHNOLOGY, IEEE, 445 Hoes Lane, Piscataway, NJ 08854-4141. GST Registration No. 125634188. CPC Sales Agreement #40013087. Return undeliverable Canada addresses to: Pitney Bowes IMEX, P.O. Box 4332, Stanton Rd., Toronto, ON M5W 3J4, Canada. IEEE prohibits discrimination, harassment and bullying. For more information visit <http://www.ieee.org/nondiscrimination>. Printed in U.S.A.

Polybinary Shaping for Highly-Spectral-Efficient Super-Nyquist WDM QAM Signals (<i>Top-Scored</i>)	1724
..... K. Igarashi, T. Tsuritani, and I. Morita	
Nyquist-Filtering (De)Multiplexer Using a Ring Resonator Assisted Interferometer Circuit (<i>Top-Scored</i>)	1732
..... L. Zhuang, C. Zhu, Y. Xie, M. Burla, C. G. H. Roeloffzen, M. Hoekman, B. Corcoran, and A. J. Lowery	
Nonlinear Digital Pre-distortion of Transmitter Components (<i>Top-Scored</i>)	1739
..... P. W. Berenguer, M. Nölle, L. Molle, T. Raman, A. Napoli, C. Schubert, and J. K. Fischer	
Subband Pairwise Coding for Robust Nyquist-WDM Superchannel Transmission (<i>Top-Scored</i>)	1746
..... C. Zhu, B. Song, L. Zhuang, B. Corcoran, and A. J. Lowery	
A Sparsity Managed Adaptive MIMO Equalization for Few-Mode Fiber Transmission With Various Differential Mode Delays (<i>Top-Scored</i>)	1754
..... D. Lee, K. Shibahara, T. Kobayashi, T. Mizuno, H. Takara, A. Sano, H. Kawakami, T. Nakagawa, and Y. Miyamoto	
FPGA Prototyping of Single-Polarization 112-Gb/s Transceiver for Optical Multilevel Signaling With Intensity and Delay Detection (<i>Top-Scored</i>)	1762
..... N. Kikuchi, T. Yano, and R. Hirai	
Frequency-Domain Volterra-Based Equalization Structures for Efficient Mitigation of Intrachannel Kerr Nonlinearities (<i>Top-Scored</i>)	1770
..... A. Bakhshali, W.-Y. Chan, J. C. Cartledge, M. O'Sullivan, C. Laperle, A. Borowiec, and K. Roberts	
Nonlinear Inverse Synthesis for Optical Links With Distributed Raman Amplification (<i>Top-Scored</i>)	1778
..... S. T. Le, J. E. Prilepsky, P. Rosa, J. D. Ania-Castañón, and S. K. Turitsyn	
Impact of Bandwidth Efficiency in Nonlinear Tolerance of Multicarrier Modulations (<i>Top-Scored</i>)	1787
..... A. C. Mesequer, J. Renaudier, R. Rios-Müller, P. Tran, and G. Charlet	
Low Complexity Advanced DBP Algorithms for Ultra-Long-Haul 400 G Transmission Systems (<i>Top-Scored</i>)	1793
..... S. B. Amado, F. P. Guiomar, N. J. Muga, R. M. Ferreira, J. D. Reis, S. M. Rossi, A. Chiuchiarelli, J. R. F. Oliveira, A. L. Teixeira, and A. N. Pinto	
Frequency-Comb Regeneration for Self-Homodyne Superchannels (<i>Top-Scored</i>)	1800
..... A. Lorences-Riesgo, T. A. Eriksson, A. Fülöp, P. A. Andrekson, and M. Karlsson	
Monolithic Integrated Slot-Blocker for High Datarate Coherent Optical Slot Switched Networks (<i>Top-Scored</i>)	1807
..... G. de Valicourt, Y. Pointurier, M. A. Mestre, S. Bigo, J.-M. Fedeli, K. Ribaud, L. Bramerie, E. Borgne, J.-C. Simon, L. Vivien, D. Marris-Morini, A. Shen, I. Ghorbel, G. H. Duan, S. Chandrasekhar, C.-M. Chang, S. Randel, and Y.-K. Chen	
WDM Orthogonal Subcarrier Multiplexing (<i>Top-Scored</i>)	1815
..... F. A. Gutiérrez, E. P. Martin, P. Perry, A. D. Ellis, P. M. Anandarajah, and L. P. Barry	
Multipass Performance of a Chip-Enhanced WSS for Nyquist-WDM Sub-Band Switching (<i>Top-Scored</i>)	1824
..... B. Corcoran, C. Zhu, J. Schröder, L. Zhuang, B. Foo, M. Burla, W. P. Beeker, A. Leinse, C. G. H. Roeloffzen, and A. J. Lowery	
Frequency Chirp Supported Complex Modulation of Directly Modulated Lasers (<i>Top-Scored</i>)	1831
..... D. Che, F. Yuan, Q. Hu, and W. Shieh	
Experimental Demonstration of Multidimensional Switching Nodes for All-Optical Data Center Networks (<i>Top-Scored</i>)	1837
..... V. Kamchevska, A. K. Medhin, F. Da Ros, F. Ye, R. Asif, A. M. Fagertun, S. Ruepp, M. Berger, L. Dittmann, T. Morioka, L. K. Oxenløwe, and M. Galili	
Low-Power Optical Packet Switching for 100-Gb/s Burst Optical Packets With a Label Processor and 8 × 8 Optical Switch (<i>Top-Scored</i>)	1844
..... T. Segawa, S. Ibrahim, T. Nakahara, Y. Muranaka, and R. Takahashi	
Novel Coherent Optical OFDM-Based Transponder for Optical Slot Switched Networks (<i>Top-Scored</i>)	1851
..... M. A. Mestre, J. M. Estarán, P. Jennevé, H. Mardoyan, I. T. Monroy, D. Zibar, and S. Bigo	
Power-Efficient 100 Gb/s Transmission Over Transoceanic System (<i>Top-Scored</i>)	1859
..... H. Zhang, A. Turukhin, O. V. Sinkin, W. Patterson, H. G. Batshon, Y. Sun, C. R. Davidson, M. Mazurczyk, G. Mohs, D. Foursa, and A. Pilipetskii	
Transmission Over 1050-km Few-Mode Fiber Based on Bidirectional Distributed Raman Amplification (<i>Top-Scored</i>)	1864
..... M. Esmaelpour, R. Ryf, N. K. Fontaine, H. Chen, A. H. Gnauck, R.-J. Essiambre, J. Toulouse, Y. Sun, and R. Lingle, Jr.	
Analytical and Experimental Results on System Maximum Reach Increase Through Symbol Rate Optimization (<i>Top-Scored</i>)	1872
..... P. Poggiolini, A. Nespola, Y. Jiang, G. Bosco, A. Carena, L. Bertignono, S. M. Bilal, S. Abrate, and F. Forghieri	
Submarine Transmission Systems Using Digital Nonlinear Compensation and Adaptive Rate Forward Error Correction (<i>Top-Scored</i>)	1886
..... A. Ghazisaeidi, I. F. de Jauregui Ruiz, L. Schmalen, P. Tran, C. Simonneau, E. Awwad, B. Uscumlic, P. Brindel, and G. Charlet	
Multicarrier Digital Backpropagation for 400G Optical Superchannels (<i>Top-Scored</i>)	1896
..... F. P. Guiomar, S. B. Amado, R. M. Ferreira, J. D. Reis, S. M. Rossi, A. Chiuchiarelli, J. R. F. de Oliveira, A. L. Teixeira, and A. N. Pinto	
Crosstalk Reduction With Bidirectional Signal Assignment on Square Lattice Structure 16-Core Fiber Over WDM Transmission for Gradual Upgrade of SMF-Based Lines (<i>Top-Scored</i>)	1908
..... M. Arikawa, T. Ito, E. L. T. de Gabory, and K. Fukuchi	
Demonstration of Virtualizeable and Software-Defined Optical Transceiver (<i>Top-Scored</i>)	1916
..... Y. Ou, S. Yan, A. Hammad, B. Guo, S. Peng, R. Nejabati, and D. Simeonidou	

All-Optical Programmable Disaggregated Data Centre Network Realized by FPGA-Based Switch and Interface Card (Top-Scored)	Y. Yan, G. M. Saridis, Y. Shu, B. R. Rofoee, S. Yan, M. Arslan, T. Bradley, N. V. Wheeler, N. H.-L. Wong, F. Poletti, M. N. Petrovich, D. J. Richardson, S. Poole, G. Zervas, and D. Simeonidou	1925
Dynamic Virtual Network Reconfiguration Over SDN Orchestrated Multitechnology Optical Transport Domains (Top-Scored)	A. Aguado, M. Davis, S. Peng, M. Victoria Álvarez, V. López, T. Szyrkowiec, A. Autenrieth, R. Vilalta, A. Mayoral, R. Muñoz, R. Casellas, R. Martínez, N. Yoshikane, T. Tsuritani, R. Nejabati, and D. Simeonidou	1933
Monitoring Plane Architecture and OAM Handler (Top-Scored)	N. Sambo, F. Cugini, A. Sgambelluri, and P. Castoldi	1939
Transport Mechanisms for Mobility Support in Optical Slot Switching-Based Next-Generation Mobile Backhaul Networks (Top-Scored)	N. Benzaoui, Y. Pointurier, B. Ušćumlić, T. Bonald, Q. Wei, and S. Bigo	1946
Software-Defined Defragmentation in Space-Division Multiplexing With Quasi-Hitless Fast Core Switching (Top-Scored)	G. Meloni, F. Fresi, M. Imran, F. Paolucci, F. Cugini, A. D'Errico, L. Giorgi, T. Sasaki, P. Castoldi, and L. Pot	1956
Optimal BBU Placement for 5G C-RAN Deployment Over WDM Aggregation Networks (Top-Scored)	F. Musumeci, C. Bellanzon, N. Carapellese, M. Tornatore, A. Pattavina, and S. Gosselin	1963
Cognitive Methodology for Optical Amplifier Gain Adjustment in Dynamic DWDM Networks (Top-Scored)	U. Moura, M. Garrich, H. Carvalho, M. Svolenski, A. Andrade, A. C. Cesar, J. Oliveira, and E. Conforti	1971
Scalable Monitoring and Optimization Techniques for Mega-Scale Data Centers (Top-Scored)	M. P. Anastasopoulos, A. Tzanakaki, and D. Simeonidou	1980
First Demonstration of Six-Mode PON Achieving a Record Gain of 4 dB in Upstream Transmission Loss Budget (Top-Scored)	H. Wen, C. Xia, A. M. Velázquez-Benítez, N. Chand, J. E. Antonio-Lopez, B. Huang, H. Liu, H. Zheng, P. Sillard, X. Liu, F. Effenberger, R. Amezcua-Correa, and G. Li	1990
Bidirectional EDFAs That Support E2-Class Power Budget of TWDM-PON Without Using Gain-Clamped Light Source (Top-Scored)	M. Fujiwara, R. Koma, K.-I. Suzuki, and A. Otake	1997
Demonstration of Symmetrical 25 Gb/s TDM-PON With Multilevel Interleaving of Users (Top-Scored)	V. Houtsma, D. van Veen, and H. Chow	2005
Photonic Frequency Double-Mixing Conversion Over the 120-GHz Band Using InP- and Graphene-Based Transistors (Top-Scored)	K. Sugawara, T. Kawasaki, G. Tamamushi, H. Mastura, A. Dobroiu, T. Yoshida, T. Suemitsu, H. Fukidome, M. Suemitsu, V. Ryzhii, K. Iwatsuki, S. Kuwano, J.-I. Kani, J. Terada, and T. Otsuji	2011
Demonstration of Upstream WDM+FDMA Reflective PON and Real-Time Implementation on an FPGA Platform (Top-Scored)	S. Straullu, P. Savio, A. Nespola, V. Ferrero, R. Gaudino, and S. Abrate	2020
Polarization-Independent Coherent Real-Time Analog Receiver for PON Access Systems (Top-Scored)	M. Artiglia, M. Presi, F. Bottoni, M. Rannello, and E. Ciaramella	2027
Polarization-Insensitive Single-Balanced Photodiode Coherent Receiver for Long-Reach WDM-PONs (Top-Scored)	M. S. Erklınc, D. Lavery, K. Shi, B. C. Thomsen, P. Bayvel, Robert I. Killey, and S. J. Savory	2034
Monolithically Integrated Dual-Output DEML for Full Duplex DPSK-ASK and DPSK-SSB ONU in Ultra-Dense Channel Spaced Access Network (Top-Scored)	G. Y. Chu, I. N. Cano, V. Polo, C. Kazmierski, R. Brenot, and J. Prat	2042
Wireless Visible Light Communications Employing Feed-Forward Pre-Equalization and PAM-4 Modulation (Top-Scored)	X. Li, N. Bamiedakis, X. Guo, J. J. D. McKendry, E. Xie, R. Ferreira, E. Gu, M. D. Dawson, R. V. Penty, and I. H. White	2049
Reflective Crosstalk Cancellation in Self-Seeded WDM PON for Mobile Fronthaul/Backhaul (Top-Scored)	N. Cheng, L. Zhou, X. Liu, and F. J. Effenberger	2056
Photon Ranging for Upstream ONU Activation Signaling in TWDM-PON (Top-Scored)	L. Bertignono, V. Ferrero, M. Valvo, and R. Gaudino	2064
