

2014 IEEE Avionics, Fiber-Optics and Photonics Conference

(AVFOP 2014)

**Atlanta, Georgia, USA
11-13 November 2014**



**IEEE Catalog Number: CFP14AVF-POD
ISBN: 978-1-4799-2475-2**

TABLE OF CONTENTS

Tuesday, November 11, 2014

TuA1 Opening Session

| | | |
|------|--|-----|
| TuA1 | DARPA Programs in High-Capacity Communications | 1 |
| TuA2 | Space-Based Gravitational-wave Observatories | N/A |
| TuA3 | Flying the SpaceX Dragon capsule to the ISS | N/A |

TuB1 Electronic Warfare

| | | |
|------|---|---|
| TuB1 | Photonics for Electronic Warfare | 3 |
| TuB2 | Autonomous Receivers for Complex Format Identification and Demodulation | 5 |
| TuB3 | RF Photonic Components for Miniature Doppler Radar | 7 |
| TuB4 | RF Switch Matrix Design and Trade Study in Photonics | 9 |

TuC1 RF Photonics

| | | |
|------|---|----|
| TuC1 | DISTRIBUTION, DOWN-CONVERSION, AND DEMODULATION OF HIGH SPECTRAL EFFICIENCY DIGITAL MODULATION SIGNALS USING PHOTONIC FREQUENCY CONVERTERS | 11 |
| TuC2 | Electrooptic Millimeter-Wave Downconversion and Vector Demodulation Using Phase-Modulation and Optical Filtering | 13 |
| TuC3 | Photonic Frequency Downconversion Link Theory and Simulation | 15 |
| TuC4 | PHASE-STABLE HETERODYNE DETECTION USING COHERENT ORTHOGONAL LIGHT-WAVES | 17 |
| TuC5 | Demonstration of 54.8-GHz Radio-Over-Fiber System with wavelength reuse based on distributed intensity conversion | 19 |
| TuC6 | An Investigation for Coexistence in Radio over Fiber with 10Gbps Optical OOK signal | 21 |
| TuC7 | Performance Evaluation of Wavelength Division Multiplexed Radio-over-Fiber De-multiplexer for 96-GHz-band Frequency-Modulated Continuous-Wave Signal Delivery | 23 |

TuD1 Devices I

| | | |
|------|--|----|
| TuD1 | Emerging Millimeter Wave Photonic Devices and Integration Platforms for Avionic Applications | 25 |
| TuD2 | High SFDR 'Super-Ring' Microresonator Based True-Time-Delay (TTD) | 27 |
| TuD3 | INDUCED TRANSPARENCY IN DOUBLE-RING PHOTONIC SWITCHES FOR OPTICAL NETWORKS-ON-CHIP | 29 |
| TuD4 | High Power Photodiodes for Photonics Technology in Naval Applications | 31 |

Wednesday, November 12, 2014

WA1 System Applications

| | | |
|------------|---|-----|
| WA1 | Fiber Optic Applications for Tactical Vehicles | 33 |
| WA2 | A 15-GHZ ELECTRO-OPTIC MEASUREMENT SYSTEM FOR NOISY ENVIRONMENTS | 35 |
| WA3 | Photonics and Advanced Computing Programs | N/A |
| WA4 | OPTICALLY DRIVEN 90-GHz RADAR SYSTEM USING BROADBAND IQ DOWNCONVERTER | 37 |
| WB1 | Integrated Photonics I | |
| WB1 | Wavelength stabilization of integrated photonics with coherent optical feedback loops and 3D integration | N/A |
| WB2 | Photonic Integrated Circuits for Avionics Network Access and Backbone Network Interface WDM LAN Applications | 39 |
| WB3 | LOW V_p , HIGH BANDWIDTH, SMALL FORM FACTOR INPMODULATOR | 41 |
| WB4 | JEPIX : ACCESS TO GENERIC FOUNDRY PROCESSES FOR INP PHOTONIC INTEGRATED CIRCUITS | 43 |
| WC1 | Transceivers | |
| WC1 | Telecom Trends in Photonic Technologies | N/A |
| WC2 | Multi-Mode Fiber Optic Repeater | 45 |
| WC3 | A Multi-Channel Fiber-Optic Bench with Stamped Mirrors for Avionic Transceivers | 47 |
| WC4 | Integrated Fiber-Wireless Access Architecture for Mobile Backhaul and Fronthaul in 5G Wireless Data Networks | 49 |
| WC5 | 10 Gbps Multiple Channel Optical Transceivers for harsh environment applications | 51 |
| WC6 | Long wavelength VCSEL based Transceivers for Aerospace Communication | 53 |
| WD1 | Devices II | |
| WD1 | Utility of the Period-One Oscillation State in Injection-Locked Semiconductor Lasers | 55 |
| WD2 | Nonreciprocal Coupler Isolator | 57 |
| WD3 | A CONCEPT OF WIDE-APERTURE OMNIDIRECTIONAL ISOLATOR BASED ON METAL-DIELECTRIC MAGNETO-PHOTONIC STRUCTURES | 59 |
| WD4 | Complete Electro-Optic Formalism Using the Nonlinear Optical Wave Equation Description and some Resultant New Device Approaches | 61 |

Thursday, November 13, 2014

| | | |
|-------------|---|-----|
| ThA1 | Communication Networks | |
| ThA1 | The use of Integrated Photonics and a Fiber Optic DWDM Network for Next Generation Weapons and Payloads | N/A |
| ThA2 | Avionic WDM LAN Node Utilizing Wavelength Conversion | 63 |
| ThA3 | Digital WDM LAN for Small Platforms | 65 |
| ThA4 | AEROSPACE FIBER OPTIC AND PHOTONIC STANDARDS: PAST, PRESENT, AND FUTURE | 67 |

| | | |
|-------------|--|-----|
| ThB1 | Integrated Photonics II | |
| ThB1 | ADVANCES IN MANUFACTURING OF OPTICAL SILICONE WAVEGUIDES FOR HIGH PERFORMANCE COMPUTING | 69 |
| ThB2 | A PHOTONIC INTEGRATED CIRCUIT BASED OPTICAL MESH NODE FOR AVIONIC WDM OPTICAL NETWORKS | 71 |
| ThB3 | Chip-Scale RF Optical Systems | 73 |
| ThB4 | Low-Stress Silicon Nitride Platform for Broadband Mid-Infrared Microphotonics | 75 |
| ThC1 | Connectors/Cables | |
| ThC1 | DESIGN AND PERFORMANCE OF EXPANDED BEAM, MULTI-FIBER CONNECTORS | 77 |
| ThC2 | AN EPOXYLESS SINGLE-FIBER ST CONNECTOR FOR HARSH AVIONIC ENVIRONMENTS | 79 |
| ThC3 | FIBER OPTIC INSTALLATION AND ACCEPTANCE CRITERIA: END FACE QUANTITATIVE CHARACTERIZATION WITH ANALYSIS OF OBJECTIVE CRITERIA | 81 |
| ThC4 | Polymer Waveguide Flex Circuits: Optical and Environmental Measurements | N/A |
| ThC5 | Tetrimide(TM): Soluble Polyimide Optical Fiber Coatings for Avionics | 83 |
| ThC6 | AUTOMATED HDRI SOLVES CHALLENGE OF DETECTING DEFECTS IN HIGHLY REFLECTIVE FIBERS | 85 |