Room D (Capri), 2F | Chair: Inwoong Kim (1Finity)

Tu4D | June 30 (Tue), 2026

DSP for Short-Reach Optical Access | 15:00-16:30

Tu4D-1 **Invited** **15:00-15:30**

Real-Time FPGA Implementation of a PTBC DSP Architecture for Coherent-Lite Fronthaul Optical Access Links

Hun-Sik Kang, Chanho Park, Jung-Yeol Oh, Jongwan Kim, Joon Ki Lee, Hae Young Rha
Electronics and Telecommunications Research Institute

We demonstrate a real-time FPGA implementation of a feedforward PTBC DSP architecture for coherent-lite fronthaul links. The proposed design enables scalable high parallelism processing and achieves 100-Gb/s 16-QAM transmission over 20 km single-mode fiber (SMF).

Tu4D-2 **15:30-15:45**

Mini-Batch Gradient Descent Adam Algorithm for Fast-Converging Volterra Equalizers

Jaeyoon Kim, Hoon Kim
Korea Advanced Institute of Science and Technology

An Adam-optimized Volterra nonlinear equalizer using mini-batch gradient descent is proposed and demonstrated for IM/DD systems. We achieve significantly faster convergence than traditional RLS-based Volterra equalizers in 240 Gb/s PAM-4 signal experiments.

Tu4D-3 **15:45-16:00**

A Novel 3-D SVDD System with 64-Point Stokes Constellation for Short-Reach Optical Communication

Weiqi Lu, Yuhao Fang, Puzhen Yuan, Jiwei Xie, Dayu Shi, Haojie Zhu, Zexu Liu, William Shieh
Westlake University

We propose a DP-IQ-based 3-D SVDD scheme that directly generates a 64-point constellation in the Stokes space. We experimentally transmit 30-Gbaud 3-D SVDD signals over 10-km SSMF with KAN equalizer mitigating nonlinear distortion.

Tu4D-4 **16:00-16:15**

Amplitude-Directed DD-LMS Equalizer for Multipath Interference Mitigation in IMDD PAM4 Systems

Runlin Tan, Meng Xiang, Junjiang Xiang, Gai Zhou, Songnian Fu, Yuwen Qin
Guangdong University of Technology

We propose an amplitude-directed decision- directed least-mean-square (DD-LMS) equalizer for multipath interference (MPI) mitigation in IMDD PAM4 links, experimentally achieving ~1.4 dB signal-tointerference ratio tolerance improvement over recently reported MPI-mitigation techniques.

Tu4D-5 **16:15-16:30**

Performance Comparison of Transition and Level-Based Equalization in Direct-Modulated Laser-Based IM/DD Optical Links

Meng-Ci Sie, Benedictus Yohanes Bagus Widhianto, Jyehong Chen, Meng-Ting Zhou, Ming-Lin Kan
National Yang Ming Chiao Tung University

This work experimentally compares transition- and level-based equalizers in 26.5625-GBd VCSEL IM/DD link under extender 500 multimode range. Results show that transition-based DFE achieves superior skew mitigation and BER improvement with significantly reduced tap complexity.