

Room D (Capri), 2F

Chair: Masanori Nakamura (NTT, inc.)

Th2D

July 2 (Thu), 2026

DSP Technologies for Coherent Optical Transmission and Monitoring

10:15-11:45

Th2D-1 Invited 10:15-10:45

Modeling Equalization-Enhanced Phase Noise

Benedikt Geiger¹, Fred Buchali², Vahid Aref², Laurent Schmalen¹

¹Karlsruhe Institute of Technology (KIT), ²Nokia

Equalization-enhanced phase noise has emerged as a critical impairment in high-baud-rate coherent optical systems. This talk reviews recent modeling advances, highlights its distortion-induced nature, and discusses implications for DSP-based mitigation.

Th2D-2 10:45-11:00

Improving the Accuracy of Longitudinal Power Profile Estimation with Statistical Averaging

Inwoong Kim¹, Olga Vassilieva¹, Ryu Shinzaki², Motohiko Eto², Paparao Palacharla¹

¹Finity Americas, Inc., ²Finity

The statistical average of longitudinal power profile estimations (PPE), obtained by concatenating multiple sampled waveforms, achieves better accuracy than a simple average of individual PPEs. Experimentally, this method improved the PPE dynamic range by 7 dB.

Th2D-3 11:00-11:15

Cost-Effective FA-MSO-NN Equalizer for PDM PS-1024QAM Coherent Optical Transmission

Tingyu Fu, Suhua Wang, Jiajun Ji, Jiajia Shen, Mingyi Gao

Soochow University

We propose and experimentally demonstrate a featureaugmented multi-symbol-output neural network for 20- Gbaud PDM PS-1024QAM transmission over 80 km SSMF, significantly reducing computational complexity and providing a cost-efficient, high-capacity solution for nextgeneration metro data center interconnects.

Th2D-4 11:15-11:30

Wide-Range and Low-Complexity Frequency Offset Compensation Utilizing Complex-Valued Gardner Timing Error Detector

Tomonaga Tanaka, Hidemi Noguchi, Kenji Wakafuji

NEC Corporation

We propose a low-complexity carrier frequency offset compensation method utilizing the complex-valued Gardner timing error detector. Combined with coarse compensation reducing error to within the symbol rate, it enables widerange compensation and supports high-order QAM.

Th2D-5 11:30-11:45

SNR Estimation of Weakly Coupled Multicore Fiber Transmission Lines Using GNPpy

Yusuke Sasaki¹, Koshiro Hashihara², Wakako Maeda¹, Masaki Wada³, Takashi Matsui³, Kazuhide Nakajima³

¹NEC Corporation, Kawasaki, ²Tokyo Metropolitan University, ³NTT, inc.

We extend the open-source tool GNPpy to estimate the signal-to-noise ratio for multicore fiber transmission lines. The extended GNPpy shows good agreement with both the analytically derived SNR and the experimental results.