

Room B (Grand Ballroom 2), 2F

Chair: Kwangyong Song (Chung-Ang University)

Tu1B

June 30 (Tue), 2026

Distributed Fiber-Optic Sensing II

08:30-10:00

Tu1B-1

08:30-08:45

Kilometer-Range Strain Sensing Using Slope-Assisted PPRM-BOCDR

Takumi Morikawa¹, Keita Kikuchi^{1,2}, Ryo Inoue¹, Yosuke Mizuno², Heeyoung Lee¹

¹Shibaura Institute of Technology, ²Yokohama National University

We demonstrate slope-assisted Brillouin optical correlation-domain reflectometry based on periodic pseudorandom modulation, enabling kilometer-range distributed strain sensing. A 50-cm strained section was detected at 1 km with 6.9-cm spatial resolution and ~2000 effective sensing points.

Tu1B-2

08:45-09:00

Linear-Region Extension of Slope-Assisted BOTDR by Using Linear Frequency-Modulated Pulses

Lihuang Li, Jiageng Chen, Yang Zhang, Mengying Ru, Zuyuan He

Shanghai Jiao Tong University

A significantly extended linear region for slope-assisted BOTDR has been achieved by employing linear frequency modulated (LFM) pulses. An approximately 380 MHz linear region is experimentally demonstrated, exhibiting excellent slope linearity ($R^2 > 0.99$).

Tu1B-3

09:00-09:15

Bridging the Domain Gap in DAS: Adapting Vision Foundation Models for Infrastructure Security

Yangmin Ding, Sarper Ozharar, Ting Wang

NEC Labs America, Inc.

Distributed Acoustic Sensing may suffer severe cross-day domain shift. We bridge this gap by encoding 1D phase signals into physics-informed 3-channel gradient tensors and adapting Vision Foundation Models (ViT-B/16), achieving superior threat detection over baselines.

Tu1B-4

09:15-09:30

Up to Two Orders of Magnitude Data Volume Reduction in Distributed Fiber Sensing by Compressed Wavelets

Antonia Baies^{1,2}, Amirhossein Ghazisaeidi¹, Rajiv Boddeda¹, Haik Mardoyan¹, Christian Dorize², Sterenn Guerrier¹, Jérémie Renaudier¹

¹Nokia Bell-Labs France, ²Ecole Polytechnique

We introduce a novel signal-processing architecture leveraging compressed sensing and wavelets to reduce data volume in distributed fiber sensing. In a binary classification over field trial data we achieved up to 100-fold (20-fold) compression at the expense of an absolute accuracy decrease of 6.5% (2.5%).

Tu1B-5

Invited

09:30-10:00

Fiber Optic Sensing Using Submarine Cables

Miguel Gonzalez-Herraez¹, Maria R. Fernandez-Ruiz², Hugo F. Martins¹, Javier Macias-Guarasa², Erick E. Ramirez-Torres², Daniel Pizarro², Javier Tejedor³, Pedro J. Vidal-Moreno², Sira E. Palazuelos-Cagigas², Sonia Martin Lopez¹, Ethan Williams⁴, Zhongwen Zhan⁴, Roel Vantillo⁵

¹CSIC, ²University of Alcalá, ³Universidad San Pablo CEU, ⁴California Institute of Technology, ⁵Marlinks

Submarine optical fiber cables are essential to global communications, but are vulnerable to damage. Distributed Acoustic Sensing combined with machine learning can detect threats and also provide ocean data, improving understanding of waves, currents, etc.