Symposium Speaker	
Full Name	Yosuke Mizuno
Affiliation	Tokyo Institute of Technology
Presentation Title	Recent Advances of Single-End-Access Distributed Brillouin Sensing

Biography

Yosuke Mizuno received the B.E., M.E., and Dr. Eng. degrees in electronic engineering from the University of Tokyo in 2005, 2007, and 2010, respectively. From 2007 to 2010, he worked on Brillouin optical correlation-domain reflectometry (BOCDR) for his Dr. Eng. degree. From 2010 to 2012, as a JSPS Research Fellow (PD), he worked on polymer optics at Tokyo Institute of Technology as well as at Federal Institute for Materials Research and Testing(BAM), Germany. Since 2012, he has been an Assistant Professor at Tokyo Institute of Technology, where he is active in fiber-optic sensing, polymer optics, and ultrasonics. He has authored more than 120 refereed journal papers and has given more than 20 invited talks at international conferences including OFS-23, APOS 2016, and OFS-25.

200 words abstract

Distributed optical fiber sensors have been extensively studied on account of their capability of strain and temperature measurement at an arbitrary location along a long optical fiber. In general, distributed oscillation measurement requires real-time operation of the sensing systems. However, real-time operations have been conventionally achieved only for two-end-access systems; such systems reduce the degree of freedom in embedding the sensors into structures, and furthermore render the measurement no longer feasible when extremely high loss or breakage occurs at a point along the sensing fiber. Here, we demonstrate real-time distributed measurement with intrinsic one-end accessibility by using specially configured Brillouin optical correlation-domain reflectometry (BOCDR) systems. Technical details and the latest findings (such as the detection of a shortest-ever hot spot using a “beyond-nominal-resolution” effect of “slope-assisted BOCDR”) will be presented. The loss-insensitive operation using a trench-index-type fiber and stable operation using a polarization-maintaining fiber are also presented. The use of plastic optical fibers is also shown to be effective for highly sensitive temperature measurement. We will also present the measurement results using a silica fiber embedded in a composite structure (composed of carbon fiber reinforced plastics) to prove the system practicality.