GC2024-SG042

Performance of Seismic Observations by DAS Technology in Different Environments

Konstantin V. Kislov[1] , **Maxim V. Dmitrienko[2]**

[1] Institute of Earthquake Prediction Theory and Mathematical Geophysics, Russian Academy of Sciences
[2] Melcano IT & Trading GmbH, Vienna, Austria

kvkislov@yandex.ru

The utilization of fiber-optic distributed acoustic sensors for seismic monitoring offers several advantages over traditional methods of seismic data acquisition [1]. By leveraging existing telecommunication infrastructure, the deployment of these sensors can be done at a much lower cost and with less environmental impact. The ability to continuously monitor seismic activity in real-time allows for early detection of potential hazards, providing crucial information for disaster prevention and mitigation efforts [2].

The capabilities of fiber-optic sensors for seismic monitoring can be enhanced by use of DAS technology. Its simplicity, consistent sensitivity, and robustness make it an ideal tool for detecting seismic activity with high accuracy and reliability [3] . Additionally, signal processing techniques can be applied to extract valuable information from ambient acoustic noise, further enhancing the usefulness of DAS technology for seismic monitoring.

Overall, the integration of fiber-optic sensors with DAS technology presents a novel and cost-effective solution for global seismic monitoring. By leveraging existing infrastructure and advanced signal processing techniques, this approach has the potential to revolutionize the field of seismic tomography and enhance our understanding of seismic activity on a global scale.

We would like to explore variations of DAS data obtained from the cables installed in different environments: vibration data collected from sensing cables, ambient noise data variations, subsurface strain and seismic data measured by acoustic sensors buried underground vs seafloor [4; 5].

References.

[1] M.R. Fernández-Ruiz, M.A. Soto, E.F. Williams, S. Martin-Lopez, Z. Zhan, M. Gonzalez-Herraez, H.F. Martins, APL Photonics 5 (3) (2020) 030901.

[2] S. Baba, E. Araki, T. Yokobiki, K. Kawamata, K. Uchiyama and T. Yoshizuka, Earth Planets Space 76 (2024) 28.

[3] M. Nakano, M. Ichihara, D. Suetsugu, T. Ohminato, S. Ono, R. Vaiomounga, T. Kula and M. Shinohara, Earth Planets Space 76 (2024) 25 (2024)

[4] M. Shinohara, T. Yamada, T. Akuhara, K. Mochizuki, S. Sakai, Front. Mar. Sci. 9 (2022) 844506.

[5] F. Cheng, B. Chi, N.J. Lindsey, T.C. Dawe and J.B. Ajo-Franklin, Sci Rep 11(2021) 5613.