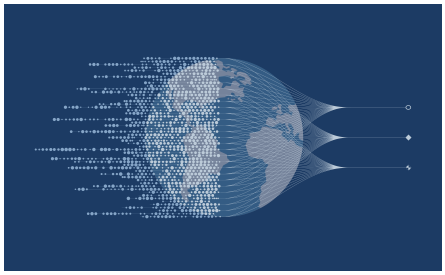

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# of 2022 and 2023 OSI Field Tests for Non-Seismic Geophysical Techniques

In 2022 and 2023, the PTS conducted field tests for the development of seismic and non-seismic geophysical techniques for deep on-site inspection (OSI) applications. The 2022 Field Test took place in the Austrian Alps over a cave system in limestone with karst voids 5-15 m in diameter at depths of 40-350 m. Non-seismic methods were deployed over two profiles: electrical resistivity tomography (ERT), frequency-domain electromagnetics (FDEM) and gravitational field mapping (GRV) over one of the profiles (together with seismic methods) whereas only ERT over the second profile. The 2023 Field Test was conducted in the UK on a gentler topography above the Channel Tunnel, with two rail tunnels 7.6 m in diameter excavated in chalk marl at 90 m depth. Together with seismic methods, ERT measurements were conducted over two profiles and GRV measurements over one of them. In both tests, the electrical conductivity measurements reveal detailed subsurface geology, including direct detection of some shallow caves by ERT, and the GRV anomalies are consistent with locations of the 2023 targets. Based on the tests, a new GRV workflow was developed for OSI. Joint interpretation of non-seismic and seismic results emphasizes the complementary nature of different techniques and data processing approaches.

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