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workflows for rapid understanding of ACT and RES imaging potential in an OSI context

Resonance seismometry (RES) and active seismic surveys (ACT) can be used during a continuation period of a CTBT on-site inspection (OSI). Given the time-restricted nature of an OSI, semi-automated workflows have been developed for quick understanding of the ACT and RES imaging potential, compatible with the standardized georeferenced data outputs of the current ACT equipment operated by the PTS. The ACT workflow follows a minimalistic processing approach including vibroseis correlation and stacking (as applicable), frequency analysis, CMP geometry creation and velocity analysis leading to generation of a brute stack. The RES workflow assumes that the subsurface cavities, tunnels etc. act as point scatters for distant wavefields or as secondary seismic sources. Under these assumptions, seismic interferometry in the form of auto- and cross-correlation is applied. Both workflows have been tested on data from the OSI 2023 Field Test in the UK and OSI 2024 Build-Up Exercise in Hungary (BUE24). For the UK case, both workflows produce coherent reflectivity from known geological boundaries and visible diffractions originating from known train tunnels. The topography and complex geology of the BUE2024 site make interpretation more ambiguous, however, the results still provide relevant information about the velocity and spectral properties of signals of interests.

E-mail

bojan.brodic@gmail.com

In-person or online preference

Primary authors: Mr BRODIC, Bojan (Former CTBTO Preparatory Commission); Ms KOIVISTO, Emilia (CTBTO Preparatory Commission); Mr LABAK, Peter (CTBTO Preparatory Commission)

Presenter: Mr BRODIC, Bojan (Former CTBTO Preparatory Commission)

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