ID: Type: **Poster**

Resonance Seismometry: A Toolbox for OSI

Besides aftershock monitoring, resonance seismometry is listed in the CTBT as passive seismological method for On Site Inspection (OSI). The objective is nuclear verification through detection of resonances, static structural anomalies and monitoring of temporal changes of subsurface properties caused by an underground nuclear explosion (UNE). During an expert meeting in November 2015 at the CTBTO several techniques have been listed, to be tested for this purpose including those relying on cavity resonances. Besides a cavity, the expected structural anomaly in the subsurface comprises also rubble and spall zones which can be used as targets for seismological exploration. We are aiming at an evaluation of the proposed methods by the investigation of the complex wave field interactions at an UNE test site through forward modeling and analysis of data collected at a natural analogue site. The appearance of the actual cavity-resonances can be predicted from analytical modeling. Origin of the resonance peaks are internal reverberations of waves transmitted to the cavity's interior and causing an echoing signal that couples out to the surrounding rock. The resonance frequencies correlate to the eigenmodes of the acoustic cavity. The frequency range of detectability is thereby restricted by intrinsic attenuation of the acoustic medium.

Primary author: SCHNEIDER, Felix Michael (Helmholtz Centre Potsdam GFZ - German Research Centre for Geosciences)

Presenter: SCHNEIDER, Felix Michael (Helmholtz Centre Potsdam GFZ - German Research Centre for Geosciences)

Track Classification: 3. Advances in sensors, networks and processing