



## **Improving Station Performance by Building Isolation Walls in the Tunnel**

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Conrad Observatory is situated far away from roads and industrial areas on the Trafelberg in Lower Austria. At the end of the seismic tunnel, the main seismic instrument of the Observatory with a station code CONA is located. This station is one of the most important seismic stations in the Austrian Seismic Network (network code OE). The seismic observatory consists of a 145m long gallery and an underground laboratory building with several working areas. About 25 meters away from the station CONA, six temporary seismic stations were implemented for research purposes. Two of them were installed with the same equipment as CONA, while the remaining four stations were set up with digitizers having lower noise and higher resolution (Q330HR) and sensors with the same type (STS-2).

In order to prevent possible disturbances by air pressure and temperature fluctuation, three walls were built inside of the tunnel. The first wall is located ca 63 meters from the tunnel entrance, while a set of double walls with a distance of 1.5 meters is placed about 53 meters from the first isolation wall but between the station CONA and the six temporary stations.

To assess impact of the isolation walls on noise reduction and detection performance, investigations are conducted in two steps. The first study is carried out by comparing the noise level and detection performance between the station CONA behind the double walls and the stations in front of the double walls for verifying the noise isolation by the double walls. To evaluate the effect of the single wall, station noise level and detection performance were studied by comparing the results before and after the installation of the wall. Results and discussions will be presented.

Additional experiment is conducted by filling insulation material inside of the aluminium boxes of the sensors (above and around the sensors). This should help us to determine an optimal insulation of the sensors with respect to pressure and temperature fluctuations.