

Seismometry: Search for Tiny Tot Underground Nuclear Explosion at Nevada Test Site

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Sonicona was contracted by the CTBTO to explore processing methods for the development of on-site inspection resonance seismometry capabilities. The motivation is to analyse seismic earthquake recordings to detect any anomalies indicative for a cavity or rubble zone caused by an underground nuclear explosion. We have developed the onset-delay method for strong earthquakes from regional to teleseismic distances. The underground disturbance will change the plane wavefield of seismic body waves. This change depends strongly on dimension, shape and depth of the rubble zone/cavity, and on all geological contrasts (heterogeneities, faults, etc.) in the surrounding area.

The data set from Source Physics Experiments 5 and 6 at the Nevada National Security Site, the former Nevada Test Site, was used for the performed analysis. We were able to identify six anomalies which are mostly related to geology, and man-made underground structures, e.g. tunnel systems. Excluding these anomalies by external knowledge one anomaly remained, and could be related to the former UNE at Tiny Tot performed in 1965.

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Promotional text

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Oral preference format

in-person

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