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Sayarim Infrasound Calibration Explosion provides first GT0 dataset for CTBTO

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The large-scale calibration explosion of about 82 tons of HE explosives, assembled as a pyramid on the soft sediment surface, was successfully conducted by the Geophysical Institute of Israel at Sayarim Military Range on 26 August 2009. High-pressure values, measured in the range 200-600 m, were higher than predicted, whereas the created crater and seismic magnitude were smaller than expected for this on-surface charge. These results confirm that the used explosives, charge design and upward detonation provided the necessary explosion energy generation and partition: maximum of energy to the atmosphere and minimum to the ground. The high-pressure observations were utilized for estimation of the important Ground Truth parameter - TNT equivalent yield of about 0.1 kT (based on positive impulse in air-shock wave). Thus the Sayarim Explosion provided the first full GT0 source dataset for on-surface large-scale explosions, recorded by infrasound stations of International Monitoring System (IMS).
Infrasound signals were well observed at distances up to 3,500 km, at numerous portable and permanent stations in Israel, Mediterranean countries and north-central Europe, including two IMS stations I26DE and I48TN and two portable arrays in Austria and Northern Italy deployed by the CTBTO team. Obtained records were used for analysis of infrasound signal propagation, source location and yield estimation, and comparison with GT0 source parameters.