Geophysical Research Abstracts
Vol. 13, EGU2011-11463, 2011
EGU General Assembly 2011


# National Data Center Preparedness Exercise 2010: Localization capability of Atmospheric Transport Modelling and analysis of wave-form signals

Ole Ross, Gernot Hartmann, Nicolai Gestermann, Thomas Plenefisch, Lars Ceranna, and Christian Bönnemann
BGR / B4.3, Hannover, Germany (ole.ross@bgr.de)

For practicing Comprehensive Nuclear-Test-Ban Treaty (CTBT) verification procedures and interplay between the International Data Centre (IDC) and National Data Centres (NDC), prepardness exercises (NPE) are regularly performed with selected events of fictitious CTBT-violation suspicion. The detection scenario of the NPE 2010 was triggered by fictitious radionuclide findings at certain stations end of October and beginning of November 2010 generated based on a hypothetical release scenario of radioactive xenon isotopes. Therefore the Radionuclide component of the International Monitoring System (IMS) and particularly Atmospheric Transport Modeling (ATM) play the key role in this exercise to shrink up the possible source region in space and time.

The shown studies were carried out without precedent knowledge about the assumed release location. The ATM simulations are based on data and tools provided by the CTBTO Provisional Technical Secretariat (PTS); furthermore own supporting model studies were performed. To determine a possible source region, the source receptor relationships derived by the PTS were analyzed in combination with additional backward simulation studies using the Lagrangian particle dispersion models HYSPLIT and FLEXPART driven by various meteorological datasets.

According to the results of the atmospheric transport modeling the locally and temporally fitting seismic events were chosen from the IDC Reviewed Event Bulletin. These events were analyzed regarding their screening parameters indicating whether they are natural or anthropogenic events. For that, seismic recordings from additional stations mainly in local and regional distances to the events were included in the analysis. The standard screening criteria for explosions are investigated, and the waveform data of the suspicious events are compared with former events with known origin. In addition, infrasound data recorded by the dedicated IMS network have been considered to support event identification, especially in the case that this scenario is based on a near surface explosion producing infrasonic signals. The events which have been figured out to be the most likely fictitious release points are finally taken as starting point for forward ATM simulations cross-checking the consistency of the supposed event of origin with the NPE detection scenario.

The conference contribution shows the individual analysis steps and challenges towards possible source identification for the NPE example and concludes with an outlook focusing on further developments of the ATM capabilities and their evaluation.