

## **Atmospheric Transport Modeling of Radio-Xenon Detections Possibly Related to the Announced Nuclear Test in North Korea on February 12, 2013**

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**Abstract :** On February 12th 2013, monitoring stations of the Preparatory Commission of the Comprehensive Nuclear Test-Ban Treaty Organization (CTBTO) detected a seismic event with explosion-like underground characteristics in the Democratic People's Republic of Korea (DPRK). The location was found to be in the vicinity of the two previous announced nuclear tests in 2006 and 2009. The nuclear test was also announced by the government of the DPRK. After an underground nuclear explosion, radioactive fission products (mostly noble gases) can seep through layers of rock and sediment until they escape into the atmosphere. The fission products are dispersed in the atmosphere and may be detected thousands of kilometers downwind from the test site. Indeed, more than 7 weeks after the explosion, unusual detections of noble gases was reported at the radionuclide station in Takasaki, Japan. The radionuclide station is a part of the International Monitoring System, operated to verify the CTBT. This study provides an estimation of the possible source region and the total radioactivity of the release using Atmospheric Transport Modeling.

**Keywords :** atmospheric transport modeling, CTBTO, nuclear tests, radioactive fission products

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