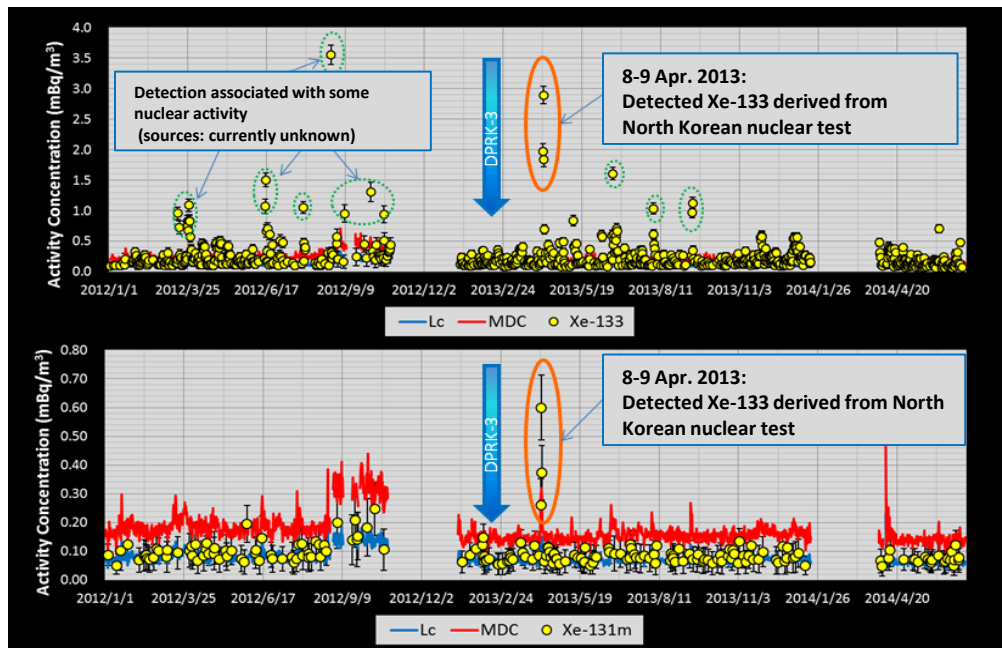


Detection of radionuclides from the 3rd nuclear test ban by North Korea

At the third underground nuclear test conducted by North Korea on February 12, 2013, the national data center (NDC-2) analyzed the observation data from the radionuclide monitoring stations of the international monitoring system in Japan and around North Korea for three weeks. There was no significant detection of artificial radionuclides as evidence of a nuclear test in this period. The radioactive xenon isotopes (Xe-133, Xe-131m), however, were simultaneously detected exceeding the normal concentration fluctuation range from the atmospheric samples collected at the Takasaki station on April 8 and 9, less than two months after the nuclear experiment (Fig.1). NDC-2 estimates of the timing of nuclear fission from the detected concentration ratio of radioactive xenon isotopes, then NDC-2 found that there is no contradiction even if it is assumed to be derived from the 3rd North Korean nuclear test.



Lc: Detection Limit, MDC: Minimum Detectable Concentration

Fig. 1 Time series of the atmospheric concentration of radioactive xenon isotopes at the Takasaki station around the 3rd North Korea nuclear test (top: Xe-133, bottom: Xe-135)

In addition, NDC-2 performed atmospheric dispersion simulations using ATM (Atmospheric Transport Model) to investigate the release area of the detected radioactive xenon. Figure 2 shows the potential release source that derived by simulating the movement of Xe-133 retroactively, starting from the Takasaki station, which simultaneously detected Xe-133 and Xe-131m. The area closer to yellow is more likely to the source area. The results calculated every few hours are overlaid in Fig.2.

The "nuclear test site" in Fig. 2 indicates the location estimated to be the possible point of underground nuclear test by seismic wave analysis by NDC-1 (Japan Weather Association). Since the estimated point of the nuclear test is within the potential source area, it is quite possible that it was the source of the Xe-133 and Xe-131m.

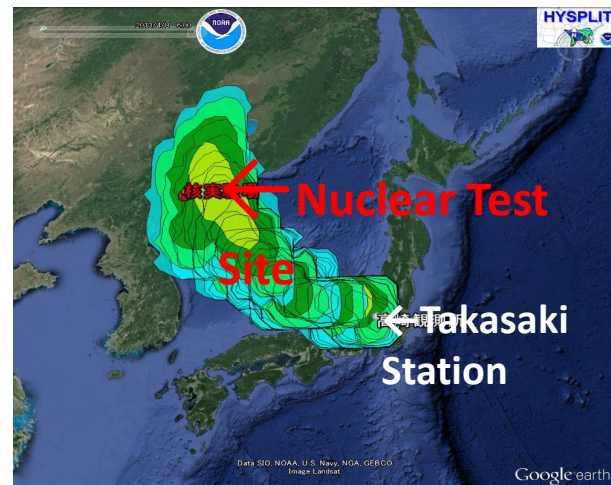


Fig.2 The result of the release area estimation