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Transport Modelling for potential releases and detections possibly connected with announced DPRK nuclear tests

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Various techniques of Atmospheric Transport Modelling were applied after announced DPRK nuclear tests in order to support the analysis of potentially connected radionuclide detections. Forward dispersion forecasts from the test-site predicted potentially affected IMS stations; forward ATM for known background sources assessed their potential contribution to measured concentrations.

In case of detections, backward ATM has shown consistency with certain emitter locations and identified coincident source regions for multiple detections.

As we think that DPRK test 2017 could and must have been the last nuclear test at all, the presentation gives a comprehensive overview how ATM supported the analysis of the National Data Centre. Special focus is how potential interference with known background sources had an impact on the assessment. In several cases measurements of releases from nuclear facilities caused ambiguous radioxenon detections in the aftermath of DPRK tests.

Finally, for two DPRK tests (2009 and 2016-Sep) it was not possible to identify potentially related radioxenon detections, for two tests there were consistent but not conclusive detections of Xe-133 only (2016-Jan, 2017) and for two tests there were matching isotopic ratios and fitting atmospheric conditions (2006, 2013).

Promotional text

The application of Atmospheric Transport Modelling in the aftermath of DPRK events gave crucial information and increased usefulness of potentially connected radioxenon detections and non-detections

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