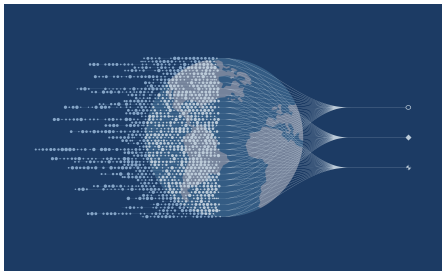

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transport modelling analyzing source regions for recurring peak detections of radioxenon at RN38 and the Pacific

A central challenge of radioxenon monitoring for the CTBT remains to classify radioactive xenon isotopes originating from reactor sources. This was also crucial for the interpretation of radioxenon detections in the aftermath of the announced North Korean nuclear test explosions. Due to its geo-location, the IMS noble gas system at RN38 played a crucial role for that. At RN38, Takasaki, several episodes of recurring high radioxenon activity concentration peaks were observed in 2024/2025. Backward atmospheric transport modelling investigates the potential source region of those peaks by determining areas of coincident sensitivity. It is combined with backward ATM for some detections at other Pacific IMS noble gas stations.
Seasonal influence of Asian monsoon circulation changes the prevailing wind directions leading to different patterns in winter/summer months.
A comparison with operational ATM dispersion forecasts from the known North Korean nuclear test site assesses the impact of the recent elevated background concentrations on the IMS detection capability.

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