



Civil and scientific applications of IMS data - prospects

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Panel 6

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Expertise and background:

- Large- to meso-scale atmospheric transport modelling (with model FLEXPART) of volcanic emissions and radionuclide releases (mainly radioxenons)
- Numerous projects/studies together with the PTS either as a contractor or as kind of scientific support of the Austrian NDC to the PTS.

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Work would not exist without IMS data, „ATM-Challenges“ entirely based on the existence of IMS radioxenon data

Work based to ~ 75% on IMS data

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Evaluating the added value of multi-input atmospheric transport ensemble modeling for applications of the Comprehensive Nuclear Test-Ban Treaty organization (CTBTO)[☆]

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International challenge to model the long-range transport of radioxenon released from medical isotope production to six Comprehensive Nuclear-Test-Ban Treaty monitoring stations



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My research interests and focus very likely would be quite different without CTBTO and IMS data!

Disclaimer: The views expressed on this presentation are those of the author and do not necessarily reflect the view of the CTBTO

Uniqueness of CTBTO IMS radionuclide data – why I like these data that much:

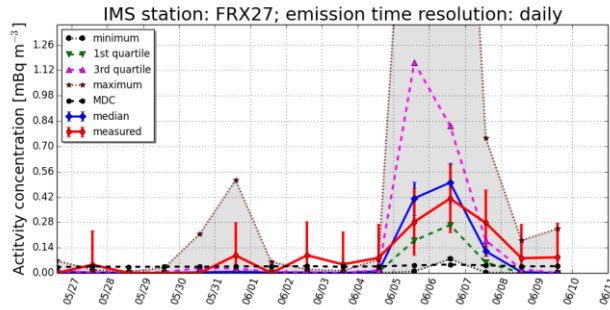
- Common (high) standards for a global network.
- Date-times are for sure in UTC: Can be a pain with national data (CET?, CEST?, EET?, EEST?.....).
- Collection start and collection stop are always provided by default: Can be a pain with national data too (sometimes only midpoint times are provided).
- Collection times are no longer than 24 hours and do not change substantially at an IMS station: Data is thus easy to process yielding valuable profiles for ATM evaluation and a solid basis for source characterization.
- MDC (LC) are provided by default: Also important for ATM evaluation.

Research applicable to data analysis methods of the PTS (in future): **(Ensemble) forecasting of the civil radioxenon background at IMS stations**

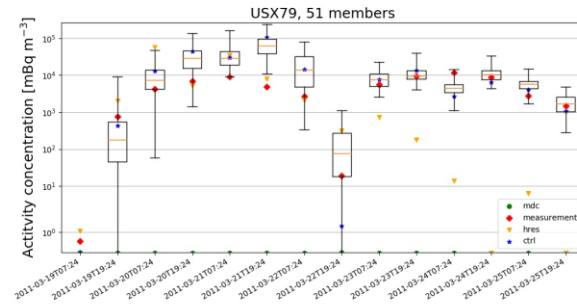
Research questions that need to be addressed on the way forward:

- How accurate (in terms of time resolution) does the emission inventory need to be taking into account typical transport ranges and typical IMS station sampling times? Are some sources more important than others? What is the effect of unknown or poorly characterized sources?
- Performance of a multi-input multi-model ensemble + the problem of redundancy?
- Performance of an ECMWF multi-input Ensemble-Prediction System (EPS) ensemble?

„2nd ATM-Challenge“
- multi-input multi-model ensemble:



Study on the added value of using ECMWF-EPS meteorological input data:



The (well-known) ultimate goal: Discriminating civil radioxenon background from violations of the Test-Ban Treaty

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