



Sensitivity tests to define the source apportionment performance criteria in the DeltaSA tool

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Identification and quantification of the contribution of emission sources to a given area is a key task for the design of abatement strategies. Moreover, European member states are obliged to report this kind of information for zones where the pollution levels exceed the limit values.

At present, little is known about the performance and uncertainty of the variety of methodologies used for source apportionment and the comparability between the results of studies using different approaches.

The source apportionment Delta (SA Delta) is a tool developed by the EC-JRC to support the particulate matter source apportionment modellers in the identification of sources (for factor analysis studies) and/or in the measure of their performance. The source identification is performed by the tool measuring the proximity of any user chemical profile to preloaded repository data (SPECIATE and SPECIEUROPE). The model performances criteria are based on standard statistical indexes calculated by comparing participants' source contribute estimates and their time series with preloaded references data.

Those preloaded data refer to previous European SA intercomparison exercises: the first with real world data (22 participants), the second with synthetic data (25 participants) and the last with real world data which was also extended to Chemical Transport Models (38 receptor models and 4 CTMs). The references used for the model performances are 'true' (predefined by JRC) for the synthetic while they are calculated as ensemble average of the participants' results in real world intercomparisons. The candidates used for each source ensemble reference calculation were selected among participants results based on a number of consistency checks plus the similarity between their chemical profiles to the repository measured data. The estimation of the ensemble reference uncertainty is crucial in order to evaluate the users' performances against it. For this reason a sensitivity analysis on different methods to estimate the ensemble references' uncertainties was performed re-analyzing the synthetic intercomparison dataset, the only one where 'true' reference and ensemble reference contributions were both present.

The Delta SA is now available on-line and will be presented, with a critical discussion of the sensitivity analysis on the ensemble reference uncertainty. In particular the grade of among participants mutual agreement on the presence of a certain source should be taken into account. Moreover also the importance of the synthetic intercomparisons in order to catch receptor models common biases will be stressed.