Lagrangian modelling tool for IAGOS database added-value products

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Since 1994, the IAGOS (In-Service Aircraft for a Global Observing System, http://www.iagos.fr) project has produced in-situ measurements of chemical as ozone, carbon monoxide or nitrogen oxides species through more than 40000 commercial aircraft flights.

In order to help analysing these observations a tool which links the observed pollutants to their sources was developped based on the Stohl et al. (2003) methodology. Build on the lagrangian particle dispersion model FLEXPART coupled with ECMWF meteorological fields, this tool simulates contributions of anthropogenic and biomass burning emissions from the ECCAD database, to the measured carbon monoxide mixing ratio along each IAGOS flight. Thanks to automated processes, 20-days backward simulation are run from the observation, separating individual contributions from the different source regions.

The main goal is to supply added-value product to the IAGOS database showing pollutants geographical origin and emission type and link trends in the atmospheric composition to changes in the transport pathways and to the evolution of emissions. This tool may also be used for statistical validation for intercomparisons of emission inventories, where they can be compared to the in-situ observations from the IAGOS database.