



## **Source attribution using FLEXPART and carbon monoxide emission inventories for the IAGOS In-situ Observation database**

Alain Fontaine (1), Bastien Sauvage (2), Hervé Pétetin (2), Antoine Auby (2), Damien Boulanger (1), and Valerie Thouret (2)

(1) CNRS, Observatoire Midi-Pyrénées, Toulouse, France (alain.fontaine@obs-mip.fr), (2) CNRS, Université Paul Sabatier, Laboratoire d'Aérodynamique, Toulouse, France

Since 1994, the IAGOS program (In-Service Aircraft for a Global Observing System <http://www.iagos.org>) and its predecessor MOZAIC has produced in-situ measurements of the atmospheric composition during more than 46000 commercial aircraft flights. In order to help analyzing these observations and further understanding the processes driving their evolution, we developed a modelling tool SOFT-IO quantifying their source/receptor link. We improved the methodology used by Stohl et al. (2003), based on the FLEXPART plume dispersion model, to simulate the contributions of anthropogenic and biomass burning emissions from the ECCAD database (<http://eccad.aeris-data.fr>) to the measured carbon monoxide mixing ratio along each IAGOS flight.

Thanks to automated processes, contributions are simulated for the last 20 days before observation, separating individual contributions from the different source regions. The main goal is to supply add-value products to the IAGOS database showing pollutants geographical origin and emission type.

Using this information, it may be possible to link trends in the atmospheric composition to changes in the transport pathways and to the evolution of emissions. This tool could be used for statistical validation as well as for inter-comparisons of emission inventories using large amounts of data, as Lagrangian models are able to bring the global scale emissions down to a smaller scale, where they can be directly compared to the in-situ observations from the IAGOS database.