

EGU21-1269, updated on 28 Jul 2021

<https://doi.org/10.5194/egusphere-egu21-1269>

EGU General Assembly 2021

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## The IAGOS Research Infrastructure for monitoring atmospheric composition and air quality using commercial aircraft

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IAGOS (In-service Aircraft for a Global Observing System) is a European Research Infrastructure for global observations of atmospheric composition using commercial aircraft. Commercial aircraft are ideal platforms for providing long-term in-situ measurements with high vertical and temporal resolution, particularly at cruise altitude (between 9 and 13 km) in the climate-sensitive region of the atmosphere known as the upper troposphere-lower stratosphere (UTLS). IAGOS also provides landing and take-off profiles at almost 300 airports throughout the world which are of major interest for air quality issues. Fully automated instruments are permanently installed on Airbus A330 aircraft operated by different airlines. Data are collected on about 500 flights per aircraft per year. All the aircraft measure the abundances of many essential climate variables, chiefly ozone and the precursor carbon monoxide, water vapour, clouds and meteorological parameters. Additional instruments can be installed to measure nitrogen oxides, aerosols, or the greenhouse gases carbon dioxide and methane. The data are transmitted in near to real real time to weather services and are freely available for the scientific community, national air quality prediction centres and the Copernicus Atmosphere Monitoring Service (CAMS). We describe the importance of these measurements in the monitoring of global atmospheric composition and air quality. In particular, we show examples from the Copernicus Atmosphere Monitoring Service (CAMS) where IAGOS data are used in the evaluation and improvement of forecasts of air quality over Europe, and discuss how the development of the IAGOS data transmission and instrumentation may fertilize infrastructure development for other airborne platforms.