

The Contributions of IAGOS to Air Quality and Climate Monitoring, and Sustainable Aviation

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The European Research Infrastructure IAGOS utilizes state-of-the-art instruments onboard passenger aircraft to measure trace gases, aerosols, and cloud particles. The vertical profiles of climate- and air quality-relevant species (O₃, CO, NO, NO₂, NO_x, CO₂, CH₄, and H₂O/relative humidity) near airports in highly populated urban areas (e.g., Frankfurt (Main) and Paris) complement surface-based stations or remote-sensing instrumentation for studying the chemical composition of the lower troposphere. The data (O₃, CO, H₂O, CO₂, CH₄) is partially transmitted in near-real-time to the Copernicus Atmosphere Monitoring Service (CAMS) to continuously validate CAMS air quality models. The routine measurements of relative humidity and cloud particles at cruising altitudes are also beneficial for understanding the occurrence patterns of contrail cirrus, which are aviation-induced ice clouds that contribute to atmospheric warming. Consequently, they aid research on contrail mitigation through air traffic management. Key examples of IAGOS data used in various atmospheric research topics will be presented.

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