CARBON MONOXIDE MEASUREMENTS ABOARD COMMERCIAL AIRBUS AIRCRAFT: TECHNICAL VALIDATION AND FIRST SCIENTIFIC RESULTS OF THE MOZAIC III PROGRAMME.

P. Nedelec (1), J.P. Cammas (1) and V. Thouret (1).

(1) Laboratoire d’Aérologie, CNRS, Observatoire Midi-Pyrénées, UMR 5560, 14 avenue Edouard Belin, 31400 Toulouse, France. nedp@aero.obs-mip.fr /Fax: +33 561332790

The European funded MOZAIC program (Measurements of ozone and water vapour by Airbus in-service aircraft) is operational since 1994 aboard 5 commercial Airbus A340. It has gathered more than 19 000 long-range flights with ozone and water vapour between ground and 12 km altitude. A new Infra-Red carbon monoxide analyser has been developed for installation on the MOZAIC equipped aircraft since 2002. Improvements of the basic characteristics of commercial CO analysers allowed to achieve suitable performance for routine aircraft measurements and the first year of operation aboard 4 aircraft with more than 1000 flights have proven the reliability and the scientific interest of this CO analyser.

The interest of these regular measurements on commercial aircraft with simultaneous ozone, CO and water vapour measurements are presented here with individual cases: (1) a typical winter mid-latitude tropopause fold observed during an ascent from Frankfurt, (2) a stratospheric filament sampled over the Atlantic during the cruise phase at 11 km altitude, (3) a vertical profile over Mumbai (India) showing different pollution layers, (4) convective events in high altitude over eastern Asia with strong vertical transport from the emission areas. These cases are discussed using ECMWF analysis and/or satellite images and show that the temporal/spatial resolution of the measurements is relevant for processes studies and for models validation.