Name of research institute or organization:

Institut für Umweltphysik, Universität Heidelberg

Title of project:

Long-term observations of $^{14}CO_2$ at Jungfraujoch

Project leader and team:

Ingeborg Levin, project leader
Samuel Hammer, Bernd Kromer, Dietmar Wagenbach

Project description:

Atmospheric $^{14}CO_2$ observations at Jungfraujoch are used as clean air background for other observational sites in Central Europe to estimate the regional fossil fuel CO_2 component; they are also applied as reference for carbon cycle studies or bomb radiocarbon dating of young organic material. Our measurements have started in 1986 and are continued without interruption until today. The available data from the last decade have been submitted for publication, together with those from the Schauinsland station in the Black Forest (Levin et al., 2012). Figure 1 shows the comparison of these two $\Delta^{14}C$ records. It is obvious that generally the Jungfraujoch data are slightly higher than those from the Schauinsland site in the Black Forest, particularly in winter. This clearly demonstrates that Schauinsland, compared to Jungfraujoch, is slightly more influenced by regional and large scale European fossil fuel CO_2 emissions.

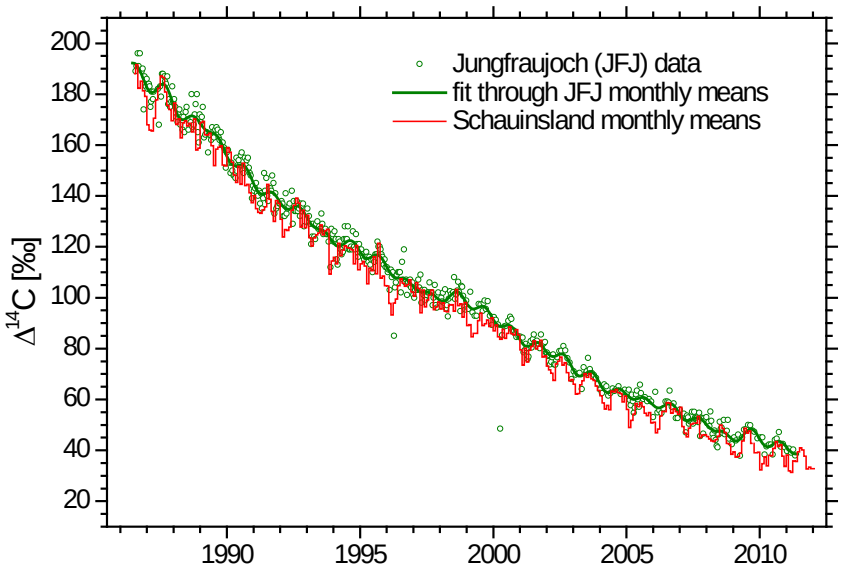

Figure 1: Comparison of $^{14}CO_2$ measurements at Jungfraujoch (green open circles) with monthly mean values from Schauinsland station in the Black Forest (red line). The green line is a harmonic fit curve calculated through the Jungfraujoch data

Our quasi-continuous $^{14}CO_2$ observations at Jungfraujoch will be continued in the framework of the European ICOS (Integrated Carbon Observation System) Atmospheric Station network, and continue to serve as reference for estimates of the fossil fuel CO_2 component over Europe.

Key words:

Carbon dioxide, carbon cycle modelling, radiocarbon, fossil fuel CO_2, climate, Kyoto Protocol

Internet data bases:

http://www.iup.uni-heidelberg.de/institut/forschung/groups/kk/
http://www.iup.uni-heidelberg.de/institut/forschung/groups/fa/radiokohlenstoff/radiometrie-web-html

Collaborating partners/networks:

ICOS (http://www.icos-infrastructure.eu)

Scientific publications and public outreach 2012:

Refereed journal article:

Levin, I., B. Kromer and S. Hammer, Atmospheric $\Delta^{14}CO_2$ trend in Western European background air from 2000 to 2012, submitted to Tellus B., 2012.

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