

Name of research institute or organization:

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**Institut für Umweltphysik, Universität Heidelberg**

Title of project:

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Long-term observations of  $^{14}\text{CO}_2$  and  $^{222}\text{Radon}$  at Jungfrauoch

Project leader and team:

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Ingeborg Levin, project leader  
Bernd Kromer  
Felix Vogel

Project description:

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Atmospheric  $^{14}\text{CO}_2$  observations at Jungfrauoch are used as background for other observational sites in Central Europe to estimate the regional fossil fuel  $\text{CO}_2$  component. The measurements have been started in 1986 and were continued without interruption until today. In recent years, the Jungfrauoch background  $^{14}\text{CO}_2$  level was used to calculate the fossil fuel  $\text{CO}_2$  component at Schauinsland station as well as in Heidelberg from respective  $^{14}\text{CO}_2$  observations. These results are described in detail by Gamnitzer et al. [2006] and Levin et al. [2007].

Atmospheric  $^{222}\text{Radon}$  daughter observations started at Jungfrauoch in April 2006 in the frame of the EU-funded CarboEurope-IP and EuroHydros Projects.  $^{222}\text{Radon}$  observations will be used to identify (polluted) air masses that have recently been in contact with continental surfaces as well as for flux estimates of other continent-borne trace gases using the Radon-Tracer-Method.

References:

Gamnitzer, U., U. Karstens, B. Kromer, R. E. M. Neubert, H. A. J. Meijer, H. Schroeder, and I. Levin, 2006. Carbon monoxide: A quantitative tracer for fossil fuel  $\text{CO}_2$ ? *J. Geophys. Res.*, *111*, D22302, doi:10.1029/2005JD006966.

Levin, I., S. Hammer, B. Kromer and F. Meinhardt, 2007. Radiocarbon observations in atmospheric  $\text{CO}_2$ : Determining fossil fuel  $\text{CO}_2$  over Europe using Jungfrauoch observations as background. *Submitted to Science of the Total Environment*.

Key words:

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carbon dioxide, Radiocarbon, fossil fuel  $\text{CO}_2$ , climate, Kyoto Protocol  
 $^{222}\text{Radon}$ , atmospheric tracer

Internet data bases:

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<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:

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CarboEurope-IP (<http://www.carboeurope.org/>)  
EuroHydros (<http://www.meteor.uni-frankfurt.de/eurohydros/>)

Scientific publications and public outreach 2006:

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**Refereed journal article:**

Gamnitzer, U., U. Karstens, B. Kromer, R. E. M. Neubert, H. A. J. Meijer, H. Schroeder, and I. Levin, 2006. Carbon monoxide: A quantitative tracer for fossil fuel CO<sub>2</sub>? *J. Geophys. Res.*, *111*, D22302, doi:10.1029/2005JD006966.

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