Name of research institute or organization:

Eawag

Title of project:

Cosmogenic radionuclides in precipitation

Project leader and team:

Prof. Jürg Beer, project leader
Marian Fujak, Silvia Bollhalder

Project description:

Since several years the cosmogenic radionuclides ^{7}Be and ^{10}Be are measured in precipitation samples collected monthly at Jungfraujoch and in Dübendorf. These data reflect on the one hand changes in the cosmic ray intensity, and on the other hand transport effects due to atmospheric mixing processes (e.g. stratosphere-troposphere exchange) and deposition processes. Recently the transport processes have been modeled successfully using the ECHAM-HAM general circulation model (Heikkilä, 2008).

These data play a crucial role in the interpretation of cosmogenic radionuclides measured in natural archives such as polar ice core because they provide the link between the instrumental era with high-resolution high-precision neutron monitor data and the long-term records based solely on cosmogenic radionuclides. An interesting question which will be addressed with the new data is whether the extended period of very low solar activity between cycles 23 and 24 is visible in cosmogenic radionuclide data.

Key words:

Cosmic ray induced production of radionuclides, atmospheric transport and mixing

Collaborating partners/networks:

MPI Hamburg, Bjerknes Centre for Climate Research, Bergen

Scientific publications and public outreach 2010:

Refereed journal articles and their internet access

Calogovic, J., C. Albert, F. Arnold, J. Beer, L. Desorgher, and E. O. Flueckiger (2010), Sudden cosmic ray decreases: No change of global cloud cover, *Geophys. Res. Lett., 37*.

Heikkila, U., J. Beer, and V. Alfimov (2008), Beryllium-10 and beryllium-7 in precipitation in Dubendorf (440 m) and at Jungfraujoch (3580 m), Switzerland (1998-2005), Journal of Geophysical Research-Atmospheres, 113(D11).

Theses

Heikkilä, U. (2007), Modeling of the atmospheric transport of the cosmogenic radionuclides ^{10}Be and ^{7}Be using the ECHAM5-HAM general circulation model, ETH Zürich, Zürich.

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