

Name of research institute or organization:

Eawag

Title of project:

^7Be and ^{10}Be in monthly precipitation

Project leader and team:

Prof. Jürg Beer, project leader
Dr. Friedhelm Steinhilber, Silvia Bollhalder

Project description:

^7Be ($T_{1/2}$: 53.2 days) and ^{10}Be ($T_{1/2}$: 1.4 million years) are produced continuously by the interaction of cosmic rays with the atmosphere. They represent a kind of a natural neutron monitor. Instead of counting the neutrons the Be-atoms are counted. Since these atoms are stored in natural archives such as ice sheets and sediments ^{10}Be offers the unique opportunity to trace back the past cosmic ray intensity for many millennia. An important aspect in the interpretation of the archived ^{10}Be signal is the “noise” introduced by the transport of Be from the atmosphere where it is produced to the site where it is archived. Simultaneous monitoring of ^{10}Be and ^7Be at two stations (Jungfraujoch and Dübendorf) provides the means to better understand the transport and deposition processes. New model calculations of the transport are currently carried out and will be compared with the observations. Another important issue to be addressed is the extraordinary solar minimum between cycle 23 and 24.

Key words:

^{10}Be , ^7Be , long-term cosmic ray record, atmospheric transport processes

Collaborating partners/networks:

K. G. McCracken, Australia

Scientific publications and public outreach 2011:

Refereed journal articles and their internet access

Beer, J., McCracken, K.G, Abreu, J., Heikkilä, U., Steinhilber, U., Cosmogenic Radionuclides as an Extension of the Neutron Monitor Era into the Past: Potential and Limitations, *Space Science Reviews* **93**: 107-19, 2000.

<https://springerlink3.metapress.com/content/1hr441v601750484/resource-secured/?target=fulltext.html&sid=yx1vbekej1oogusk432jojih&sh=www.springerlink.com>

Mann, M., Beer, J., Steinhilber, F., Abreu, J. A., Christl, M., Kubik, P. W., Variations in the depositional fluxes of cosmogenic beryllium on short time scales, *Atmospheric Environment*, 45/17, 2836-2841, 2011.

<http://www.sciencedirect.com/science/article/pii/S1352231011002408>

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