

Name of research institute or organization:

Eawag

Title of project:

⁷Be and ¹⁰Be in monthly precipitation

Project leader and team:

Prof. Jürg Beer, project leader
Silvia Bollhalder

Project description:

⁷Be (T_{1/2}: 53.2 days) and ¹⁰Be (T_{1/2}: 1.4 million years) are continuously produced by the interaction of cosmic rays with the atmosphere. They represent a kind of 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, ¹⁰Be offers the unique opportunity to trace back the past cosmic ray intensity for many millennia. An important aspect in the interpretation of the archived ¹⁰Be 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 ¹⁰Be and ⁷Be at two stations (Jungfraujoch and Dübendorf) provides the means to better understand the transport and deposition processes. A new topic of interest which was brought up during an ISSI team meeting is the question to what extent cosmogenic radionuclides can be used to trace back in time very large solar flares or strong gamma ray bursts. A monthly monitoring program as carried out at Jungfraujoch has the potential to answer this question.

Key words:

¹⁰Be, ⁷Be, long-term cosmic ray record, atmospheric transport processes, solar energetic particles, gamma ray bursts

Collaborating partners/networks:

K. G. McCracken, Australia

Scientific publications and public outreach 2012:

Books

Beer, J., McCracken, K.G., von Steiger, R., *Cosmogenic Radionuclides: Theory and Applications in the Terrestrial and Space Environments*, Springer-Verlag, 2012.

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