Geophysical Research Abstracts
Vol. 18, EGU2016-4163-1, 2016
EGU General Assembly 2016

Low ^{10}Be concentrations in geomorphic studies: Problems, strategies, and examples

Sara Savi (1), Stefanie Tofelde (1,2), Hella Wittmann (2), Steven Binnie (3), Stefan Heinze (3), Taylor Schildgen (1,2)

(1) Institute of Earth and Environmental Science, University of Potsdam, Karl-Liebknecht-Str. 24, Haus 27, 14476 Potsdam-Golm, Germany (sara.savi@geo.uni-potsdam.de), (2) Helmholtz-Zentrum Potsdam, Deutsches GeoForschungsZentrum (GFZ), Telegrafenberg, 14473 Potsdam, Germany, (3) Institute of Geology and Mineralogy, University of Cologne, Albertus-Magnus-Platz, 50931 Cologne, Germany

In the last two decades, the use of *in situ* cosmogenic nuclides for the quantification of exogenic processes and the determination of exposure ages of landforms has seen a fast and broad expansion. Among the group of terrestrial cosmogenic nuclides that can be used to study geomorphic processes (e.g. ^{10}Be, ^{26}Al, ^{36}Cl, ^{3}He, ^{21}Ne and ^{22}Ne), *in situ*-produced ^{10}Be is the most widely used, especially for the quantification of denudation rates. However, there are a number of problematic issues related to the use of cosmogenic nuclide techniques in rapidly evolving landscapes because of the typically low ^{10}Be abundancies. The difficulties encountered in these settings are mainly related to (1) the mass of clean quartz that can be obtained and thus the total amount of ^{10}Be available, and (2) the backgrounds of the sample preparation and measurement processes. In order to improve measurements in these circumstances, a series of steps can be taken into consideration during field work and sample preparation to help improve the final results. We discuss the quality of the blanks, blank corrections, and the limits of detection of the technique in the specific case of low concentration samples. Based on a number of different synthetic scenarios, we demonstrate the importance of blank corrections and utility of determination limits, and we highlight how these parameters may affect the reliability and meaningfulness of the results. This information in turn helps to illustrate how low-concentration data should be interpreted and reported.