Introducing flotation for accurate quartz versus feldspar separation in cosmogenic nuclides methods applied to fluvial sediments in Pamir

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The Pamir form the western continuation of the Himalayan orogen, one of the Earth's largest and most active intra-continental orogen. Complex interactions of tectonic and climatic forces with relief, promote the Pamir as an excellent setting to study surface processes and quantify surface response rates. The continental convergence provokes topographic growth of E-W trending mountain ranges that guide the rivers draining the Pamir. The ability of rivers to incise and transport sediment from the plateau to the orogen margins is controlled not only by (tectonic) base level changes but also by discharge, and hence, climatic factors. Therefore, the geodynamic and climatic features of the Pamir have implications for surface processes such as erosion, mass movements, rock falls, and glacier dynamics, all of which can pose a risk to the inhabitants of the region.

To quantify the rates of surface processes in the Tajik Pamir, we use cosmogenic nuclide-based methods. We focus on ^{10}Be and ^{26}Al in quartz of fluvial sediments. Sampling included (A) modern river sediments and (B) fluvial terraces parallel to OSL samples for erosion rates as well as (C) depth profiles for exposure age estimation. According to standard cosmogenic nuclide preparation procedures, we extracted the BeO from quartz by (1) physical quartz separation, (2) chemical cleaning of quartz, (3) BeO extraction and (4) final target preparation. However, accurate measurement results and hence, interpretation, essentially relies on the quality of sample preparation. In particular, the separation of quartz and feldspar has been challenging. The sampled material from Pamir contained high amounts of various feldspars that cause uncertainties in consecutive chemical procedures for extracting the BeO from the target mineral (quartz) before AMS measurement.

For most of our samples, the physical quartz enrichment was not sufficient for further chemical treatment. Especially in the case of combined ^{10}Be and ^{26}Al analysis the remaining feldspar causes *in situ* Al contamination. Hence, we tested feldspar flotation to improve the quartz enrichment in our samples. Here we present an introduction on the procedure of feldspar flotation and present first results about the efficiency along with some recommendations for it's application.

We conclude that the flotation separation is accurate method of the separation quartz from feldspar for fluvial sediment in cosmogenic nuclides method.

Keywords: cosmogenic nuclides, flotation, separation feldspar from quartz