



DEPARTMENT OF GEOSCIENCE
FACULTY OF SCIENCE
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To the editor of *Quaternary Geochronology*

February 19, 2015

Dear editor,

We enclose a manuscript entitled “A multi-nuclide approach to constrain landscape evolution and past erosion rates in previously glaciated terrains”, which we hope you will consider for publication in *Quaternary Geochronology*. The ideas and methods presented here have not been presented before, and the manuscript is not under consideration for publication in another journal.

The potential use of cosmogenic nuclides in landscapes with a complex history of exposure and erosion is often very limited due to the large number of associated unknowns. This means that the glacial-nonglacial landscape history and associated erosion rates are often very poorly constrained in many high-latitude and/or mountain regions, such as e.g. Greenland, Scandinavia, Tibet, and Antarctica.

In this study, we present a novel multi-nuclide approach to study the landscape evolution and past erosion rates in terrains with a complex exposure history, particularly focusing on regions that were repeatedly covered by glaciers or ice sheets during the Quaternary. The approach, based on the Markov Chain Monte-Carlo (MCMC) technique, focuses on mapping the range of landscape histories that are consistent with a given set of measured cosmogenic nuclide concentrations.

We believe that the novel and highly flexible approach presented in this study will be applicable to many landscape settings characterized by a complex exposure history. In particular, it may help advance our understanding of the evolution of previously glaciated landscapes and constrain past erosion rates, i.e. parameters that are often unknown in such terrains. The new method is based on a Matlab code that we plan to make publicly available when the paper eventually is published.

We have strived to follow the guidelines for submission to *Quaternary geochronology*. Please do not hesitate to contact us if you have any questions.

On behalf of the authors,

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