Geophysical Research Abstracts
Vol. 16, EGU2014-11165, 2014
EGU General Assembly 2014

Absolute calibration of cosmogenic 3He and 21Ne production rates in pyroxene from the San Pedro Volcano, Chile (3400 m, 22°S)

Romain Delunel (1), Fritz Schlunegger (1), Ingo Leya (2), and Igor Villa (1)

(1) Institute of Geological Sciences, University of Bern, Switzerland (romain.delunel@geo.unibe.ch), (2) Space Research and Planetary Sciences, University of Bern, Switzerland

Research aiming at dating landforms and quantifying rates of Earth surface processes has greatly benefited from the development of Terrestrial Cosmogenic Nuclides in recent years. However, constant improvements on the precision and accuracy of the cosmogenic dating technique are required in order to pace with the increasingly diverse and complex fields of applications. Here we report preliminary results obtained on the calibration of cosmogenic 3He and 21Ne production rates from an independently Ar/Ar dated lava flow surface of the San Pedro volcano in North Chile (3400 m a.s.l., 22°S). Cosmogenic noble-gas analyses were conducted on the noble gas extraction line designed for terrestrial materials that has recently been installed at the University of Bern. 3He and 21Ne analyzes have been performed on clinopyroxene (augite) and orthopyroxene (hypersthene) phenocrysts present in the fine-grained andesite that constitutes the lava flow. We propose a refined elemental production rates for cosmogenic noble-gases 3He and 21Ne based on the different chemical composition of these two coexisting minerals. These preliminary results bring new constrains on the production rates of cosmogenic noble gases at low latitude, high-elevation and in minerals that are common constituents of volcanic rocks. This study finally presents the characteristics and current performances on the new noble-gas extraction line specifically designed for terrestrial samples at the University of Bern.