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In situ produced cosmogenic 10Be and 36Cl measurement in Serra do Cipó marble

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Over the last twenty years, the use of cosmogenic nuclides has allowed a spectacular growth in the quantification of processes in the earth sciences. Besides the field of accelerator mass spectrometry, the accurate application of these approaches implies that the nuclide production rates are well known. During the last decade, a lot of work has been done in the field of production rate calibration, but less work has been done in the production rate calibration within different minerals to expand the applicability of the cosmogenic nuclides to new environments or lithological settings.
Even if one can get a good idea of what the production rate of a given mineral can be based on numerical simulations on experimentally determined cross sections, sometimes the energy ranges of these experiments are not comparable to the entire natural energy range, and this may yield large uncertainties in the production rate determinations.
In this work, we will present a second attempt at the determination of the production rate of ^{10}Be in carbonate (^{10}Be-carb) in natural samples collected along a 10 m depth profile in a Brazilian marble from Serra do Cipó mountain range (Minas Gerais). These ^{10}Be-carbs will be compared to ^{36}Cl measured within the same carbonate as well as the ^{10}Be measured in the fine quartz fraction embedded in the marble. To do so, a simple chemical protocol has been established to eliminate the atmospheric ^{10}Be that may be adsorbed on the sample surface.
Even though the expected exponential decrease is well observed for the three datasets, the relative production ratios between them are totally unexpected and will be presented and discussed during the workshop.

Student Submission

No

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