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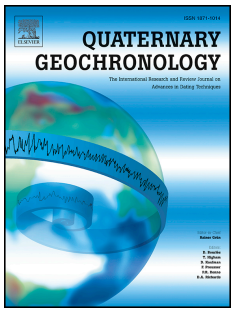

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Cosmogenic Nuclide Systematics and the CRONUScalc Program

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Abstract

As cosmogenic nuclide applications continue to expand, the need for a common basis for calculation becomes increasingly important. In order to accurately compare between results from different nuclides, a single method of calculation is necessary. Calculators exist in numerous forms with none matching the needs of the CRONUS-Earth project to provide a simple and consistent method to interpret data from most commonly used cosmogenic nuclides. A new program written for this purpose, CRONUScalc, is presented here. This unified code presents a method applicable to ^{10}Be, ^{26}Al, ^{36}Cl, ^{3}He, and ^{14}C, with ^{21}Ne in testing. The base code predicts the concentration of a sample at a particular depth for a particular time in the past, which can be used for many applications. The multi-purpose code already includes functions for calculating surface exposure age for a single sample or for a depth profile containing multiple samples. The code is available under the GNU General Public License agreement and can be downloaded and modified to deal with specific atypical scenarios.

Keywords: cosmogenic nuclide, exposure age calculator, beryllium-10, chlorine-36, aluminum-26, helium-3, carbon-14