



## **CosmoCalc: an Excel Add-In for cosmogenic nuclide calculations**

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As dating methods using Terrestrial Cosmogenic Nuclides (TCN) become more popular, the need arises for a general-purpose and easy-to-use data reduction software. The CosmoCalc Excel add-in calculates TCN production rate scaling factors (using Lal, Stone, Dunai and Desilets methods); topographic, snow and self-shielding factors; exposure ages, erosion rates and burial ages; and visualizes the results on banana-style plots. It uses an internally consistent TCN production equation that is based on the quadruple exponential approach of [Granger and Smith, 2000, NIM-B (172) pp. 824-828]. CosmoCalc was designed to be as user-friendly as possible. Although the user-interface is extremely simple, the program is also very flexible, and nearly all default parameter values can be changed. To facilitate the comparison of different scaling factors, a set of converter tools is provided, allowing the user to easily convert cut-off rigidities to magnetic inclinations, elevations to atmospheric depths and so forth. Because it is important to use a consistent set of scaling factors for the sample measurements and the production rate calibration site, CosmoCalc defines the production rates implicitly, as a function of the original TCN concentrations of the calibration site. The program is best suited for  $^{10}\text{Be}$ ,  $^{26}\text{Al}$ ,  $^3\text{He}$  and  $^{21}\text{Ne}$  calculations, although basic functionality for  $^{36}\text{Cl}$  and  $^{14}\text{C}$  is also provided. CosmoCalc is free and open-source software. It can be downloaded along with a set of test data from <http://cosmocalc.googlepages.com>