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Young Uplift at the Eastern End of the Alps. Evidence for Uplift Unrelated to the Inversion of the Pannonian Basin?

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The eastern end of the Alps features a series of low relief surfaces at elevations up to 2500 m. These surfaces have long been known to reflect uplifted planation surfaces that have not yet been dissected by fluvial processes and thus preserve a strong geomorphic disequilibrium. While their age would present a good handle on the age of surface uplift in the Eastern Alps, these surfaces are barely dated and their age is only indirectly inferred to reflect the Miocene and Pliocene uplift history. Recent geomorphological cosmogenic nucleide-based studies have shown that these surfaces may record up to 1000 m of surface uplift in the last 5 Ma. Such a distinct uplift event in the recent past is surprising and needs to be interpreted. Interestingly, this time frame appears not to be accompanied by crustal shortening and the standard hypothesis about the inversion of the Pannonian Basin as the underlying cause needs to be questioned. In order to get a better handle on the nature of this young uplift event and its overriding driver it is crucial to understand its spatial extent. However, much of the Eastern Alps was glaciated in the Pleistocene and currently several studies suggest that elevated low-relief landscapes were shaped by the glacial buzz-saw, instead of interpreting them in terms of fluvial prematurity of recently uplifted planation surfaces. The models of glacial erosion versus fluvial prematurity as the formation agent of the low-relief surfaces can be discerned if it can be shown that the surfaces formed prior to the Pleistocene. Here we report of a currently operating research project in which we employ cosmogenic nucleide burial dating on a substantial part of the entire Eastern Alps to derive the age of these surfaces. We use the burial age of siliceous sediments in caves formed at the phreatic-vadose transition as a proxy. Correlation of cave levels with low-relief surfaces and their mapping in the field is an integral part of the project.

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