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## New paleoelevation constraints on the Mid-Miocene Central Alps

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Reconstructing past elevations of mountain ranges improves our understanding of crustal- and mantle-scale geodynamic processes involved in formation of orogenic belts. Recent studies suggest that slab breakoff beneath the Central Alps occurred ~30 Ma ago (e.g. Schlunegger and Castellort, 2016), while the breakoff reached the Eastern Alps about 10 Ma later (~20 Ma, e.g. Handy et al., 2015). The proposed west-to-east slab tear migration would imply variations in topography. This raises the question of a diachronous surface uplift history for the Central and Eastern Alps. Although being extremely well studied over the last century and serving as a prime example for orogenic belt evolution, there are very few investigations addressing the Neogene paleoelevation history of the European Alps. Obtained paleoelevation constraints suffer from inconsistency and range from average elevations of 2300 m (Kocsis et al., 2007) to at least 5000 m (e.g. Sharp et al., 2005).

In order to provide quantitative robust paleoelevation estimates for the Mid-Miocene Central Alps we applied stable isotope paleoaltimetry on authigenic soil carbonates from the Northern Alpine Foreland Basin (NAFB) and contrast these with syntectonic high-Alpine fault zone mica. This  $\delta$ - $\delta$  paleoaltimetry approach benefits from the advantage of comparing a low-elevation site and a high-elevation site of the same age which allows us to circumvent the basic issue of climate bias in paleoaltimetry studies.

We obtained stable isotope ( $\delta^{18}\text{O}$ ) records of pedogenic carbonate from the Swiss Molasse Basin and  $\delta\text{D}$  values of fault mica from the Simplon Fault Zone, for the Middle Miocene (15.5 – 14.0 Ma). The key element in conducting stable isotope paleoaltimetry is the prevailing temperature during low-elevation proxy material formation. Here we present new Mid-Miocene paleoelevation data for the European Central Alps based on precisely defined clumped isotope ( $\Delta_{47}$ ) derived carbonate formation temperatures and new low-elevation stable isotope records. A conservative approach renders Mid-Miocene Central Alps mean elevation of approximately 4000 m, which contrasts modern Alpine topography with average elevations of ca. 2000 m in the Central Alps (Kühni and Pfiffner, 2001).