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New thermochronological constraints on the structural evolution of the Western Cordillera of the Ecuadorian Andes

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The Cenozoic growth of the Ecuadorian Andes has been strongly influenced by the compressional reactivation of inherited crustal anisotropies, strike-slip faulting and uplift, and the erosional effects of a wet tropical climate superposed on the deforming orogen. Some authors have linked uplift in the Western Cordillera to the interaction between the South American Plate and the subduction of the oceanic Carnegie Ridge. However, recent studies have alternatively suggested that the tectonic evolution of a northward-escaping crustal sliver in western Ecuador along the Pallatanga strike-slip zone may equally well explain mountain building and topographic growth in this region. While the importance of the Pallatanga Fault has been recognized in the context of seismic hazards, its long-term impact on the development of topography and relief have not been explored in detail. With the aim to decipher the roles of oceanic ridge subduction and/or strike-slip motion in prompting the growth of the Ecuadorian Andes in the Western Cordillera we started assessing the deformation and uplift history of the Western Cordillera in the vicinity of the Pallatanga strike-slip fault using apatite (U-Th)/He thermochronology. Our new apatite (U-Th)/He dates range from 22.1 0.3 Ma to 3.9 0.1 Ma and show a clear age-elevation relationship for our two vertical profiles. The inverse modeling of the thermochronological data will provide time-temperature paths for each profile and provide new constraints on the recent exhumation history of the Western Cordillera that will enable us to unravel the overall paleo-geographical evolution of this part of the Andes.