

KINEMATIC EVOLUTION OF THE CENTRAL ANDES IN NW ARGENTINA: IMPLICATIONS FOR MOUNTAIN BUILDING PROCESSES

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ABSTRACT

In the Central Andes, the study of the Altiplano-Puna plateau has led to two different models for explaining crustal thickening and uplift. Data from the Altiplano suggest that shortening, thickening, and uplift are decoupled. There, thickening would have been controlled by shortening and crustal flow while surface uplift by lithospheric delamination. On the other hand, in the Puna, data suggests that shortening and thickening are directly related to surface uplift. This ongoing controversy with respect to the timing and processes driving crustal thickening and uplift in the central Andes raise one of the fundamental questions about mountain building processes: Is surface deformation due to shortening responsible for crustal thickening and uplift? Reconciling the timing and amount of shortening in the transition between the Altiplano-Puna is key to test if shortening, crustal thickening, and uplift are directly connected or not. The kinematic-erosional history will be studied using apatite fission track and apatite (U-Th)/He, two thermochronological techniques that provide information on erosion of ca. 2-4 km of crust. These ages will be modeled using structural and thermo-kinematic softwares to interpret temperature-time paths. Thus, this study will provide an understanding of the dynamics of Cordilleran type orogenic systems, especially regarding mechanisms for crustal thickening.

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