Tectono-thermal history of the intraplate San Bernardo fold and thrust belt in central Patagonia inferred by low-temperature thermochronology

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First low-temperature thermochronology data across the central Patagonia and thermal modeling provide information on the thermal history of the intraplate San Bernardo fold and thrust belt (44–46 °S). Apatite (U–Th-Sm)/He (AHe), fission tracks (AFT) ages and inverse thermal modeling indicate that the sedimentary rocks presently at the surface of the southwestern San Bernardo FTB have experienced a broadly similar thermal history: i) cooling at the deposition time during the Cretaceous, ii) a significant Eocene – early Miocene thermal event which totally reset the AHe data and partially the AFT data, and iii) a cooling since the early Miocene. Although former thermochronology studies in surrounding areas do not evidence any Neogene thermal event, our regionally consistent ages and thermal modeling most likely indicate a large-scale thermal event through the Eocene to the early Miocene. As sedimentary burial was not significant in this area through the Cenozoic, we propose that this heating episode might have been caused by coeval widespread and long-term intraplate volcanic processes associated with a modest burial and the increase of the geothermal gradient in the entire area, which has been strong enough to significantly affect the low-temperature thermochronometers regionally. A subsequent slow cooling phase starting from early Miocene may have been related with the termination of this intraplate volcanic phase and subsequent decrease of the thermal gradient to average values, and with a modest exhumation of ~1 km at most related to a mild deformation episode of the broken foreland and dynamic topography processes during the middle-late Miocene, as well as the weathering of the Oligo-Miocene basalts.

Mots-clés : low-temperature thermochronology, broken foreland, intraplate magmatism, Patagonia

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Merci de ne rien inscrire dans cette zone et ne pas modifier les marges des pieds de page et entêtes.