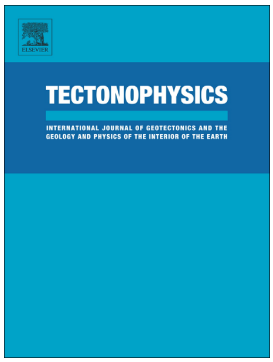

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Role of erosion and isostasy in the Cordillera Blanca uplift: insights from landscape evolution modeling (northern Peru, Andes)

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Highlights:

- Inversion of the landscape evolution coupled with thermochronological data provides constraints on erosion efficiency factor, uplift rates and geothermal gradient
- Isostatic effect of eroding a denser rock mass represent a not negligible contribution to the Cordillera Blanca uplift on a < 5 Ma time scale
- Cordillera Blanca drainage divide location is controlled by initial drainage network rather by maximum uplift rates and precipitation distribution

Abstract

The processes driving uplift and exhumation of the highest Peruvian peaks (the Cordillera Blanca) are not well understood. Uplift and exhumation seem closely linked to the formation and movement on the Cordillera Blanca normal fault (CBNF) that delimits and shapes the western flank of the Cordillera Blanca. Several models have been proposed to explain the presence of this major normal fault in a compressional setting, but the CBNF and the Cordillera Blanca recent rapid uplift remain enigmatic. Whereas the Cordillera Blanca morphology demonstrates important erosion and thus a significant mass of rocks removal, the impact of erosion and isostasy on the evolution of the Cordillera Blanca uplift rates has never been explored. We address the role of