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Post-orogenic evolution of the Sierras Septentrionales and the Sierras Australes and links to the evolution of the eastern Argentina South Atlantic passive continental margin constrained by low temperature thermochronometry and 2D thermokinematic modeling

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The eastern Argentina South Atlantic passive continental margin is distinguished by a very flat topography. Out of the so called Pampean flat two mountain ranges are arising. These mountain ranges, the Sierras Australes and the Sierras Septentrionales, are located in the State of Buenos Aires south of the capital Buenos Aires. North of the Sierras Septentrionales the Salado basin is located. The Sierras Septentrionales and the Sierras Australes are also divided by a smaller intracratonic basin. Further in the South the Colorado basin is located. The Sierras Australes is a variscian fold belt originated by strong phases of metamorphosis, but till now it is unclear by how many tectonic phases the area was influenced (Tomezzoli & Vilas, 1999). It consists of Proterozoic to Paleozoic rocks. The Sierras Septentrionales consists mainly of Precambrian crystalline rocks. The Precambrian sequences are overlain by younger Sediments (Cingolani, 2010). The aim is to understand the long-term landscape evolution of the area by quantifiying erosion- and exhumation-rates and by dating ancient rock-uplift-events. Another goal is to find out how the opening of the south atlantic took effect on this region. To fulfill this goal, thermochronological techniques, such as fission-track dating and (U-Th-Sm)/He dating has been applied to samples from the region. Because there was no low-temperature thermochronology done in this area, both techniques were applied on apatites and zircons. Furthermore, numerical modeling of the cooling history has provided the data base for the quantification of the exhumation rates. The first data-set shows clusters of different ages which can be linked to tectonic activities during late Paleozoic times. Also the thermokinematic modeling is leading to new insights of the evolution of both mountain ranges.

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