



New insights on the geological evolution of the continental margin of Southeastern Brazil derived from zircon and apatite (U-Th-Sm)/He and fission-track data

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Passive continental margins are important gearchives related to mantle dynamics, the breakup of continents, lithospheric dynamics, and other processes. The main concern yields the quantifying long-term lithospheric evolution of the continental margin between São Paulo and Laguna in southeastern Brazil since the Neoproterozoic. We put special emphasis on the reactivation of old fracture zones running into the continent and their constrains on the landscape evolution. In this contribution, we represent already consisting thermochronological data attained by fission-track and (U-Th-Sm)/He analysis on apatites and zircons. The zircon fission-track ages range between 108.4 (15.0) and 539.9 (68.4) Ma, the zircon (U-Th-Sm)/He ages between 72.9 (5.8) and 427.6 (1.8) Ma whereas the apatite fission-track ages range between 40.0 (5.3) and 134.7 (8.0) Ma, and the apatite (U-Th-Sm)/He ages between 32.1 (1.52) and 92.0 (1.86) Ma. These thermochronological ages from metamorphic, sedimentary and intrusive rocks show six distinct blocks (Laguna, Florianópolis, Curitiba, Ilha Comprida, Peruibe and Santos) with different evolution cut by old fracture zones.

Furthermore, models of time-temperature evolution illustrate the differences in Pre- to post-rift exhumation histories of these blocks. The presented data will provide an insight into the complex exhumation history of the continental margin based on the existing literature data on the evolution of the Paraná basin in Brazil and the latest thermochronological data. We used the geological model of the Paraná basin supersequences (Rio Ivaí, Paraná, Gondwana I-III and Bauru) to remodel the subsidence and exhumation history of our consisting thermochronological sample data. First indications include a fast exhumation during the early Paleozoic, a slow shallow (northern blocks) to fast and deep (Laguna block) subduction from middle Paleozoic to Mesozoic time and a extremely fast exhumation during the opening of the South Atlantic (Cretaceous time). This enables a possible interpretation of the southeastern Brazilian margin being an outer part of the Paraná basin and even the possible source area for the Ordovician to Carboniferous sediments. Further on, we try to research the newly gained exhumation history models for indications on the evolution and movement of the lithosphere of the southeastern Brazilian mantle.