



## **Landscape evolution of the Brazilian southeastern highlands, Poços de Caldas Plateau**

Carolina Doranti Tiritan (1,2), Peter C. Hackspacher (1), and Ulrich A. Glasmacher (2)

(1) Institute of Geosciences, São Paulo State University (UNESP) Brazil (cadoranti@gmail.com; phack@rc.unesp.br), (2) Institute of Earth Sciences, University Heidelberg, Heidelberg, Germany (ulrich.a.glasmaecher@geow.uni-heidelberg.de)

The complex post rift evolution of the western South Atlantic passive continental margin starts with Late Cretaceous (~90 Ma) alkaline volcanics, subvolcanics and intrusions along two NW-SE trending belts. The largest intrusion is the Poços de Caldas Alkaline Massif (PCAM) located on the west side of the Mantiqueira Mountain Range within Proterozoic greenschist to amphibolites facies metamorphic rocks. Characterized by alkaline rocks, topography reaches over 1700m (a.s.l) high. The topography of the crystalline basement, called North Crystalline Zone (NCZ), is a dissected plateau with irregular topographic ridges reaching 1200m in elevation. The PCAM and NCZ areas together form the Poços de Caldas Plateau characterized as a remnant of the South American Planation Surface resulted from erosional events from Late Cretaceous–Paleogene transition.

The Apatite Fission-Track ages range from  $333.3\pm 27.6$  to  $94.0\pm 13.7$  Ma for the metamorphic basement area (NCZ), and  $76.8\pm 10.9$  to  $48.7\pm 10.7$  Ma for the PCAM area. The older ages are concentrated on the lower topography region (lower than 1200m until ~700m a.s.l), close to the Pardo River Valley on the north. The ages on this area are from Carboniferous to Triassic, and are similar to data obtained by Cogné et al (2011).

The youngest ages can be interpreted as caused by exhumation processes in Paleocene and Eocene time.

The age-elevation relationship shows that the ages decrease systematically with increasing elevation with a break-in-slope near the 150Ma and another in 80Ma, which means two periods of exhumation that are related to the opening of the South Atlantic and timing of alkaline intrusion, respectively.

In comparison to published thermochronological data from other southeast Brazilian highlands as Mantiqueira (Hackspacher et al, 2004; Tello et al 2005) and Serra do Mar mountain ranges (Hiruma et al 2010; Cogné et al 2011; Siqueira-Ribeiro, 2011), our data indicate that the landscape evolution is associated with several distinct exhumation events at the South American passive continental margin, which include the Gondwana break-up, the Late Cretaceous alkaline magmatism, and the Cenozoic evolution of a N-S trending continental graben system.