



Temperature, exhumation, and landscape evolution of the Pocos de Caldas alkaline massive region, SE Brazil

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The Late Cretaceous Poços de Caldas Alkaline Massif (PCAM, 1550 m a.s.l.) is a circular geomorphological feature that rises ~800 m above the metamorphic basement (750 m a.s.l.) with steep flanks in all directions. The topography of PCAM is characterized by plateaus and scarps. Combining the PCAM with the surrounding area, King (1956) recognized three erosional surfaces, the Early Cretaceous Gondwana Surface (1400 m a.s.l.), the Paleocene Sul Americana Surface (~900 m a.s.l.), and the Miocene Velhas Surface (~700 m a.s.l.). Ages of the three surfaces were discussed on the base of comparison with other areas in Brazil. However, Almeida (1964) recognizes an important tectonics event that probably has uplifted the Sul Americana surface to about 1550 m a.s.l. The igneous activity have started at ~89 Ma as revealed by K-Ar age determination (Bushee, 1971, Kawashita *et al.*, 1984), and might have finished ~54 Ma (Sonoki & Garda, 1988; Ulbrich *et al.* 2002).

The complex postrift 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. At about the same time, the deposition of Late Cretaceous siliciclastic rocks (~600 m) fill the old topography of the Paraná flood

basalt surface. Close to the recent coast erosion exhumed the Precambrian basement prior to the evolution of the NE-SW trending (~1000 km) Eocene - Miocene continental graben system. The Eocene - Miocene graben system that developed in the Precambrian basement was filled with thick terrigenous sediments. At the same time, in the offshore basins large volumes of submarine volcanic rocks were deposited. Inversion of the rift basin took place in post-early Miocene time with the development of various NE-SW trending escarpments.

Research was initiated to understand the long-term evolution of the PCAM-topography in relation to the structural and climate evolution of SE-Brazil. Apatite and zircon fission-track and (U-Th)/He thermochronology will be combined with thermokinematic modeling by using different computer codes (TERRA, PECUBE). We will present the first data on the evolution of the PCAM and surrounding area.