

# LOW-TEMPERATURE THERMOCHRONOLOGY TO CONSTRAIN THE MESOZOIC-CENOZOIC TECTONIC EVOLUTION OF THE VOLTA REDONDA TRANSFER ZONE, SE BRAZIL

Laura Mendes<sup>1,2</sup>; Mônica Heilbron<sup>1</sup>; Matthijs van Soest<sup>3</sup>; Kip Hodges<sup>3</sup>; Ramón Arrowsmith<sup>3</sup>; Luiz Guilherme Silva<sup>1</sup>; Ambrosina Gontijo-Pascutti<sup>2</sup>

<sup>1</sup> UERJ; <sup>2</sup> UFRRJ; <sup>3</sup> Arizona State University

## ABSTRACT:

We have applied low-temperature thermochronology to constrain the tectonic reactivation of the Volta Redonda Transfer Zone. The study area is located in the segment of the Neoproterozoic Ribeira belt, southeastern Brazil, which occupied a central position in Western Gondwana and is one of the key units for reconstructing the history of this supercontinent (Heilbron and Machado, 2003). Lately, during the Cretaceous and Cenozoic times, this region was reactivated by fault zones related to the development of the Continental Rifts of Southeastern Brazil (Almeida, 1976; Riccomini, 1989). Previous works have highlighted the role of transfer faults in extensional systems. The studied Volta Redonda Transfer Zone looks like a transtensional fault zone that possibly played the role of a synthetic overlapping transfer zone, linking the northern Paraíba do Sul (Taubaté and Resende Basins) and the southern Guanabara rift segments (Valeriano and Heilbron, 1993). Moreover, it also extends offshore as an important structural feature associated to transfer faults (Mohriak *et al.*, 1995; Souza, 2008). Using (U-Th)/He thermochronometry we present preliminary results of 77 apatite crystals from basement samples collected in a NW-SE transect, from the Mantiqueira Range to Guanabara graben, as well as transversally to transfer faults. Data range from  $44.4 \pm 1.5$  Ma to  $208.2 \pm 15.3$  Ma ( $2 \sigma$ ). Some of the results could be explored to obtain the time-temperature history, which indicate the correlation with the timing of regional tectonic events, associated to the reactivation process of pre-existing structures in the Brazilian continental margin.

**KEYWORDS:** (U-Th)/He Thermochronology, Transfer Zones