

Reactivation of inherited structures during the opening of the South Atlantic: a low-temperature thermochronology study on the Araçuaí orogenic belt (east Brazilian margin)

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A subject that has historically been regarded with increasing interest in geology are the supercontinent-cycles. This still poses questions about tectonic evolution on a regional scale, more precisely on the role of reactivation of older, pre-existing structures (inheritance), in which the same faults or weak zones are reactivated rather than the emergence of new systems.

A region that is ideally suited for this research is the Araçuaí-West Congo Orogenic belt (AWCO), which is situated partly in eastern Brazil (Gonçalves et al., 2014) and partly in western Africa (D.R. Congo, Congo Brazza, Gabon and Angola; Frimmel et al., 2006; Tack et al., 2001). This orogenic belt was formed during the Cambrian as a result of a series of extension and compression events, of which the final phase is known as the Braziliiano-Pan-African orogenesis (e.g. Pedrosa-Soares & Alkmim, 2011). During the break-up of Gondwana and the opening of the South Atlantic, the AWCO became separated. The main part is situated in east Brazil, known as the Araçuaí orogeny, while on the west African margin, the West Congo Belt is a witness to this event.

In order to gain a better understanding, the tectonic movements should be placed in an absolute timeframe. Multi-method low-temperature thermochronology lends itself as an ideal tool for this purpose. In this study samples from N-S and E-W profiles in east Brazil (Caparáo–Vitória–Gov. Valadares) have been acquired. These samples are investigated using the apatite fission track (AFT) and apatite (U-Th-Sm)/He (AHe) methods. In a later phase the samples which were taken on profiles in the D.R. Congo (Lower Congo) will be analysed by the same methods. Preliminary results for the Brazilian margin indicate cooling ages ranging between 55 Ma and c. 80 Ma.