

Pre-, syn- and post-breakup evolution of northern South America from apatite fission track data and inverse thermal history modelling

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Phanerozoic evolution of the Guiana Shield in northern South America is poorly known and remains an important question for source-to-sink studies. As part of the *Source to Sink* project TOTAL R&D-BRGM-INSU, this study presents a suite of 40 new apatite fission track analysis results from French Guiana, Surinam and north Brazil. Inverse thermal history modelling reveals a marked, albeit poorly constrained, period of relatively high temperatures (temperatures > 110 °C) during the Jurassic (200-150 Ma), i.e. prior to the generally accepted timing of the Equatorial Atlantic Ocean opening (150-110 Ma). Lower temperatures are recorded on the southern flank of the Amazonas Basin and a little portion of the Surinam interior. All data reveal then a protracted phase of cooling starting from ~150 Ma and representing the main event during the Mesozoic and Cenozoic for French Guiana and Surinam basement. A second thermal event is nevertheless recorded after the deposition of Upper Jurassic and Lower Cretaceous detrital sedimentary rocks on the northern flank of the Amazonas Basin. Maximum temperatures for this event (80-100 °C) are reached during the middle Cretaceous (115-90 Ma). Implications of these new results for the Guiana Shield evolution and the Equatorial Atlantic opening are discussed.

Mots-Clés : Guiana Shield, Equatorial Atlantic margin, apatite fission track