

Evaluations of thermal field in the Brasiliano mobile belts of southeastern Brazil.

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Summary

The Brasiliano mobile belts have a complex structural framework and its subsurface characteristics are still target of studies regarding the interaction between the plates, paleosutures, lineaments, thermal structure, etc. This work aims to contribute to the knowledge of the deep crustal thermal field in the area that covers parts of the São Francisco Craton, Ribeira and Brasília belts and the Araçuaí Orogen. The mobile belts of southeastern Brazil have different formation mechanisms, which may indicate thermal behavior in the crust that is also different. For the regional scale investigation of the crustal thermal characteristics in the study region, geothermal data were analyzed. The procedures adopted in the geothermal analysis included evaluations of temperatures in depth, of its geological context combined with interpretations of lithological profiles and estimates of thermal conductivity.

Results and Conclusions

Geothermal data are available for 89 sites in the study area. The Curie depth for this database was defined using the crustal temperature variation model described by Hamza (1982) and Alexandrino & Hamza (2008). The calculations were performed by setting the temperature at 580 ° C, which corresponds approximately to the Curie temperature of the magnetite. The parameters used in the crustal thermal model were adopted from Alexandrino & Hamza (2008) and Guimarães & Hamza (2019) and are different for each tectonic province. Interpolation and edge effect correction used data compiled around the study region.

The result obtained provides an overview of how the Curie depths differ according to the change of tectonic province, mainly in the central north region where a range of shallower magnetic depths is perceived in the approximate **NE-SW** direction. This result is compatible with the heat flow map, where that same range is observed for higher flow values. Result starts from a one-dimensional model for a

wide area, but to obtain a more accurately evaluation specific pre-selected areas, a two-dimensional model can be used. Such an approach can be useful to investigate areas where the heat transfer occurred more laterally, due to the lithospheric thickness and localized thermal disturbance.

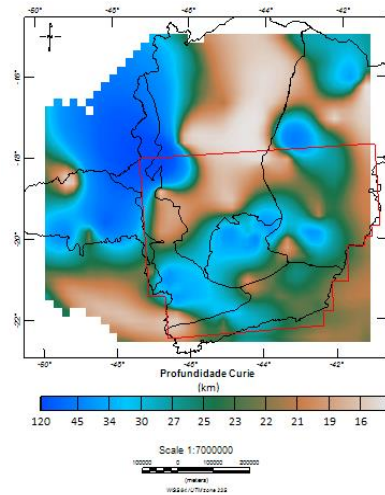


Figure 1 - Curie depth map in Minas Gerais, study area in red.

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