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Indirect estimation of the tectonic evolution of magnetic structures along the Indiavaí-Lucialva Shear Zone, Mato Grosso, Brazil

Details

Meeting	2013 Meeting of the Americas
Section	Geomagnetism and Paleomagnetism
Session	Magnetic Methods I
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Authors	Louro, V H* , Geophysics Dpt., IAG-USP, São Paulo, Brazil Ribeiro, V B , Geophysics Dpt., IAG-USP, São Paulo, Brazil Mantovani, M S , Geophysics Dpt., IAG-USP, São Paulo, Brazil GEOLIT Team
Index Terms	Magnetic anomalies: modeling and interpretation [1517] Rock and mineral magnetism [1540]

Abstract

The Indiavaí-Lucialva Shear Zone (ILSZ) has a notorious cinematic standard, moving from SW to NE, juxtaposing the Santa Helena Granitic Batholith to the metavolcanosedimentary sets and orthogneisses from the Jauru Domain basement. Along the ILSZ, a sequence of magnetic anomalies of high interference, with each other, and varied polarities occurs, what suggests the presence of different lithologies or times of (re)crystallization of the ferromagnetic minerals from these magnetic structures. In its southernmost portion, the sequence of magnetic anomalies splits in two directions, SW and SE, with the first invading the limits of the Santa Helena batholith and, the latest, accompanying the ILSZ. This study aimed for the comprehension of complex tectonic setting of this region. It analyzed the set of anomalies estimating their lateral limits, depths and directions of total magnetization, with the Enhanced Horizontal Derivatives (EHD), its extrapolation for depth estimative (EHD-Depth), and through an iterative reduction to the magnetic pole, respectively. This procedure allowed the composition of initial models for further inversions of magnetic data which, results, indicate contrasts of magnetic susceptibility in sub-surface. Once known the approximated 3-D shape of the magnetic structures along the ILSZ, the total magnetization intensity of each anomaly was recovered, what consequently allowed, by vector subtraction, to estimate their individual remnant magnetization. The remnant magnetization's inclinations and declinations of the anomalies sources and their latitudes and longitudes permitted the calculus of their respective virtual magnetic paleopoles. When confronted with the South American paleopole wander path and the datings linked to this path, available in the literature, it was possible to have an indirect approximation of the age of (re)crystallization of each magnetic structure near the ILSZ. This procedure indicated an increasing of the ages of the structures from SE (1298 Ma) to NW (1439 Ma). The southwestern anomalies invading the Santa Helena batholith showed ages of approximately 1419 Ma, what allows to infer

their allocation with the rest of the intrusion of the batholith.



Total magnetic field map of the region of the ILSZ, locating the studied anomalies, mineral occurrences and tectonic limits.

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