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Identification of new magnetic exploration targets in the southwest portion of Parecis Basin, Mato Grosso, Brazil

Details

Meeting	2013 Meeting of the Americas
Section	Near Surface Geophysics
Session	Mining Geophysics in the Americas: New Developments and Perspectives II
Identifier	NS32A-02
Authors	Ribeiro, V B* , Geophysics Dpt., IAG-USP, São Paulo, Brazil Louro, V H , Geophysics Dpt., IAG-USP, São Paulo, Brazil Mantovani, M S , Geophysics Dpt., IAG-USP, São Paulo, Brazil GEOLIT Team
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Abstract

The southwest region of the Parecis Basin (Mato Grosso state, Brazil) is marked by the presence of a diamond-bearing kimberlites alignment. Near the kimberlites intrusions of Sapé-01, Sapé-02, Jacaré-01 and Jacaré-02 several magnetic anomalies are observed associated to different igneous intrusions. In this area, three major anomalies were identified (length greater than 4 km) named as Rio Juruena, Córrego do Bugre and São José 1 to 5 (after the nearby towns) and several minor anomalies (average extension of 1,5 km). Most of their sources are placed within the limits of Parecis Basin and covered by its sediments, preventing their recognition with gammaspectrometry. The magnetic anomalies are characterized by a wide variation in the direction of total magnetization, what along the proximity of some intrusions generates a complex scenario. For this reason, the set of anomalies was split into several minor areas according to the distribution of their sources and proximity among them. For a better interpretation, techniques with low or none influence of the remanent magnetization component were used: the Enhanced Horizontal Derivative (EHD) allows delimitating the lateral borders of the intrusion. The extrapolation of the EHD technique was used aiming to estimate the depth of the upper borders of these intrusions. In order to isolate the magnetic contribution associated to each of the sources before the 3D inversion, the Amplitude of the Anomalous Magnetic Field (AAMF) was used. The borders and depth estimated by the EHD technique were used to the 3D inversions of the larger anomalies. The susceptibility contrast obtained between the anomalous sources and the embedding rock was compared with values available in the literature to restrict the possible lithologies associated with the source of the anomaly. The results indicated contrasts of susceptibility, in depths from 100 m to 200 m, what suggest that the São José anomalies are composed by dunitic and/or peridotitic-like rocks, with a susceptibilities of about 0.2 (S.I.). Meanwhile, both Córrego do Bugre and Rio Juruena showed contrasts of 0.08 (S.I.), what may be interpreted as pyroxenite-like intrusions, similarly to the kimberlites nearby these structures.



Total Magnetic Intensity (left) and Analytic Signal (right) maps location the known mineral occurrences in the region of the study.

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