

عنوان مقاله:

Aeromagnetic mapping of basement structures and gold mineralization characterization of Kirk range area, southern Malawi

محل انتشار:

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خلاصه مقاله:

A high-resolution aeromagnetic survey was conducted in the Kirk Range region in southern Malawi with the goal of obtaining comprehensive geological and structural information. This newly collected data was analyzed and interpreted in order to gain a better understanding of the mode of occurrence of gold mineralization and related structural characteristics. To understand the distribution of magnetic sources, many analytic approaches were applied to the aeromagnetic data, including reduction to the pole, Euler deconvolution, Spectrum analysis, Tilt and Vertical Derivatives filtering. Spectral analysis and Euler deconvolution were used to determine the depth of magnetic sources. The study reveals that the studied region is characterized by NE-SW and roughly E-W direction structures and that the gold occurrence is restricted within these structures, implying that mineralization is structurally controlled. These structures are found at depths of 200-1000 meters, according to Euler solutions produced from this work. Based on the calculated depths the structures controlling mineralization, in the Kirk Range are interpreted to occur at a depth range of 200 to 1000 m and the structures trend in the NE-SW and E-W direction. However current gold mining is taking place at a fairly shallow depth of less than 50 m and no gold mine has gone deeper than that. The structural pattern and depth extent estimations show that gold mineralization in the Kirk range is expected to continue up to 1000 meters because the majority of the structures controlling mineralization in the region are located within that depth range. It is therefore recommended that future exploration should go deeper to a depth of about 200-1000 meters or more focusing on these NE-SW and E-W structures, because it is expected that at that depth range more mineralization should be intercepted.

کلمات کلیدی:

Kirk Range area, Aeromagnetic anomaly, geological structures, Mineral exploration

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