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Contribution of geophysics to the study of Gouméré gold mineralization (North-East of Côte D'ivoire): Magnetometry and induced polarization

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In West Africa, Birimian formations, usually masked by laterites, are well known for their precious metal content, such as gold. In the Gouméré region (North-East of Côte d'Ivoire), geophysical studies (magnetism and induced polarization) were aimed at making a lithostructural description with the identification of possible zones of gold mineralization. The magnetic results showed that the anomalies, defined by intensity between -133.80 nT and more than 163.73 nT, indicate that the study area contains three lithological assemblies characterized by granodiorites, basic formations and complex sedimentary and volcano-sedimentary formations. Structurally, these lithological assemblages are affected by mainly N-S, NE-SW and NW-SE oriented faults and folds. Induced polarization (IP) studies demonstrate that gold mineralization is associated with these geological assemblages with the identification of three IP anomalies identified in the northwestern, southwestern and eastern parts of the study area. These IP anomalies, characterized by variable chargeabilities (6 mV/V in the East, 8.90 mV/V in the South-West and 16.1 to 18.7 mV/V in the North-West), are associated with resistant (ρ>2637 Ωm) and conductors (ρ<390 Ωm). This leads to the conclusion, that sulphide gold mineralization is disseminated in basaltic granodiorites and volcanoes, and massive in sediments and volcano-sediments. Mineralization is mainly related to hydrothermal, supergene and pervasive alteration with structural control.

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