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Structure and emplacement of the granite pluton of Tiébélé, Southern Burkina Faso (West Africa) and its implication in base metals (Zn-Pb-Cu) and gold (Au) anomalies distribution



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The Tiébélé granite pluton (TGP) is located in a central position of the Palaeoproterozoic terrains in an environment made of polymetallic massive sulphide (Zn-Pb-Cu) and gold deposit. The granite, likely undeformed, shows therefore a predominant magmatic and submagmatic structure under microscope. Orthogneissification is localised.

The study of magnetic fabric using the magnetic susceptibility anisotropy (MSA) method shows in overall a subhorizontal lineation with however an area of high plunging ($\geq 56^\circ$), which constitutes the conduct of the magma feeding. The magma should have emplaced by diapirism in a supracrustal level due to a regional shearing accommodated by an in situ flattening imputable to roof effect compared to some granites studied using the same method in other nearby regions Naba et al. [1].

The source of the magma coincides with the most prospective area for gold and base metals (especially Zn). The spatial organisation of the base metals (Zn-Pb-Cu), originally very close along a predominant



NE-SW trend, has been largely disturbed by the consecutive emplacement of the amphibole bearing granitoid from tonalite, trondjemite and granodiorite composition and later by the TGP. The thermal effect induced by TGP during its emplacement should have: i/ played a major role in remobilizing and concentrating sulphide mineral phases notably sphalerite, and ii/causing microbrecciation under fluid pressure effect. Mineralization in the south of the TGP, are hosted by quartz \pm tourmaline veins in the NE-SW shearing, on fluid pressure probably generated by the thermal anomaly of the TGP.

Figure 1: Tiébélé pluton outcrop during sampling

Key words: Burkina Faso, Palaeoproterozoic, Tiébélé granite pluton (TGP), Anisotropy of Magnetic Susceptibility (AMS), Structural petrology, Mineralization.

References:

- [1] Naba S et al. (2004) In: *Journal of African. Earth Sciences*, Vol. 38, 41–57

