Thrust to braiding transpression and transtension tectonics during the Paleoproterozoic evolution of the Birimian Greenstone Belt of Mako, Kédougou-Kéniéba Inlier, Eastern Senegal

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The structural cartography of the Birimian formations of the Mako area shows a polyphase deformation marked by variable structures such as imbricated shear zones, thrusts and reverse-shears, poly-foldings, “boudinages”, normal faults. The multiscale analysis of the various mapped structures combined with the satellite images allowed to distinguish three major phases of Eburnean deformations D₁, D₂ and D₃. The D₁ phase is compressive to thrust deformation due to SSE-NNW principal shortening direction which involves large overturned folds verging to the NW associated with minor thrust fault which are preserved in some lithologies (metabasalts, quartzites). The D₂ phase is a sinistral transpressive deformation which comprises an early (D₂a) stage followed by a late (D₂b) stage. The early D₂a stage is characterized by major NE-SW reverse-shears verging to the NW associated with NW-SE minor dextral shear zones. It is followed by D₂b stage characterized by ENE-WSW shortening direction which creates major NNW-SSE sinistral reverse-shear zones. Interference between NE-SW and NNW-SSE major reverse-shear zone of D₂a and D₂b respectively creates an anatomizing pattern of the deformation. Shearing along D₂ shear zone is associated with development of minor extensional zone which filled by varied magmatic products (mafic, intermediate and felsic). D₃ phase is a transtension deformation associated with a dextral movement which creates conjugate normal faults with locally negative flower structures. D₃ principal maximum stress is ENE-WSW oriented. The orientation of the main shortening direction of Eburnean phases D₁, D₂ and D₃ is NNW-SSE, NW-SE and ENE-WSW, respectively. Such a pattern could be induced by an anticlockwise rotation of principal maximum stress in the Mako sector. The Eburnean granitoids emplaced before and during these three Eburnean orogenic phases.

Keywords: Eburnean, Birimian, thrust, transpression, transtension, Kédougou-Kéniéba inlier