

Mapping tectonic structures of Kédougou-Kéniéba Inlier (Eastern Senegal) from satellite (LANDSAT-7 ETM⁺ / SRTM) and airborne geophysics imageries

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The lineaments of the Kédougou-Kéniéba Inlier (KKI) were mapped from the processing of several types of images: (i) various coloured combinations Red-Green-Blue of 1 to 7 bands and the panchromatic band (8) of a set of images of thematic mapping (Thematic Mapper) of Landsat-7 satellite (ETM7⁺); (ii) SRTM image (Shuttle Radar Topography Mission) or DTM (Digital Terrain Model) of the Endeavour space shuttle; (iii) as well as the aeromagnetic image of the study area. Five groups of NS, NNE-SSW, NE-SW, EW and NW-SE lineament directions were identified from these images. The NNE-SSW and NE-SW oriented lineaments are the most frequent. The NS oriented lineaments often correspond to a straightening of those oriented NNE-SSW. The EW and NW-SE oriented lineaments are rarely observed and they often intersect with previous ones. Field structural data indicate that most of these lineaments correspond to shear and/or thrust faults, or to dykes. The NE-SW oriented lineaments would be the oldest. They are generally relative to reverse shear zones and trust faults which are associated with the D₁ Eoeburnean phase of deformation. NS and NNE-SSW oriented lineaments correspond to faults and shear zones, mainly sinistral, associated with NW-SE oriented lineaments. These three sets of lineaments form a conjugated system fault, associated with the sinistral transpression phase of the D₂ Eburnean deformation phase. The occurrence of all these structures would be related to the Eoeburnean, Eburnean and post-Eburnean orogenic events. Indeed, the doleritic dykes, which have been dated between 1600 Ma and 1100 Ma, show ductile deformation which testify a post-Eburnean tectonic event (Kibarian or Hercynian?) subsequently affecting the Paleoproterozoic formations of the KKI.

Keywords: Eburnean, Landsat-7 ETM⁺ images, Shears, aeromagnetism, lineament