

EGU21-10949

EGU General Assembly 2021

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A progressive episode of deformation in the foreland of the West-Congo Belt: From folding to brittle shearing, in Republic of Congo

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The West Congo belt is a Panafrican orogenic belt that evolved and resulted from the collision of the Sao Francisco craton and the Congo Craton during late Neoproterozoic (630 Ma) to late Cambrian (490 Ma ?). It constitutes the counterpart of the most studied Araçuaí belt in Brasil. Over the past decades, most structural analysis focused in Araçuaí belt while few structural data were obtained from the West-Congo Belt. Understanding the West Congo belt and particularly in its foreland is relevant to establish a unified structural model for its evolution, as the late phases of deformation of both orogens are still debated. In the Comba basin at Mont Bélo, Loutété, Mfouati, most of the folds are gently plunging, upright to moderately inclined fold, with sometimes chevron shape, circular shape and box shape. Some of the folds show decollement within their limbs. Most of these fold display flexural slip displacements along the layers where slickensides are associated with calcite fibres. Most of the limbs developed boudinage in the carbonate layers. The folds are oriented WNW-ESE and they are cut by a system of conjugate NW-SE striking strike-slip dextral fault and NNE-SSW striking sinistral fault. A kinematic analysis from fault slip data using the Win-Tensor program reveal that faults originate from NNE-SSW shortening and ESE-WNW extension. This kinematic analysis is consistent with the orientation of the fold according the Riedel model. The brittle deformation occurred in continuity of the deformation after the folding as folds hinges are displaced in certain localities. This episode of progressive deformation probably ends with intense shearing of the belts, as several dominating regularly spaced NE-striking shear zones cut the orogen from the Republic of Congo to the democratic Republic of Congo. Further investigations will be conducted in the continuity of the west Congo Belt in the Democratic Republic of Congo in order to enlarge the regional perspective.