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The West Congo Belt of Bas-Congo (DRC) revisited: a patchwork of individual tectono-metamorphic domains as a result of South Atlantic ocean opening.

L. Tack¹, M. Fernandez¹, K. Theunissen¹, Michel Everaerts¹, D. Delvaux¹, D. Baudet¹.

¹ Royal Museum for Central Africa (RMCA), Tervuren, Belgium; luc.tack@africamuseum.be

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The Pan African West Congo Belt (WCB) is part of the Araçuaí – West Congo Orogen (AWCO) formed during Gondwana amalgamation (550 Ma). The AWCO is underlain by a 2.1 Ga Eburnean-aged basement, whose migmatitic gneisses in the WCB belong to the Palaeoproterozoic Kimeza Supergroup. The Neoproterozoic West Congo Supergroup comprises – from old to young - the Matadi, Seke-Banza & Tshela and Cataractes Groups.

The WCB extends from SW Gabon to NW Angola along the Atlantic ocean. In its central part – including Bas-Congo - displays a triple junction setting. Two segments of the fold-and-thrust belt (parallel to the ocean) merge with the Sangha aulacogen seen today in the foreland (see Glorie et al., this meeting). Both ENE-verging segments show eastward decreasing deformation and regional metamorphism. During AWCO, the Kimeza basement and the WC groups were thrust partly on each other.

The recently published GIS-based geological map of Bas-Congo (Baudet et al., 2013 and see this meeting) in fact is based on more than forty years old field mapping. Reappraisal of 1) scattered published and unpublished structural data of Bas-Congo, 2) thirty year old off-shore and on-shore geophysical data from adjacent Congo-Brazzaville and Angola and 3) new Bas-Congo data (field, geochronology, petrochemistry; four abstracts, this meeting) gives new insight in the structural complexity of the WCB. The latter is controlled by reactivation under brittle regime of two systems of inherited structures: 1) NE-SW to E-W trending basement structures and “weakness zones” of tentative Palaeoproterozoic age (parallel to trend of aulacogen) and 2) NW-SE to N-S trending thrust fronts of Pan African age (parallel to trend of WCB segments).

Simultaneous reactivation of both structural systems resulted in blockfaulting and transcurrent movement. In Bas-Congo, two such blockfaulted units of first order are exposed, separated by an E-W trending shear zone with left lateral displacement. Due to uplift, the southern unit reveals - from E to W - a deeper, more complex crustal section of the WCB (amphibolite facies to unmetamorphosed rocks) with three successive thrust fronts of first order. The northern downfaulted unit shows a more superficial crustal section.

Repeated post-Pan African reactivation, in particular as a result of Cretaceous breakup of Pangaea and South Atlantic ocean opening, has led to a patchwork of individual tectono-metamorphic domains separated by structural discontinuities. Within each domain only a limited part of the Bas-Congo geology and virtual lithostratigraphy can be observed. It is essential to take into account this challenging structural setting during revision of geological mapping and lithostratigraphy, as currently in progress.