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Transposition of structures in the Neoproterozoic Kaoko Belt (NW Namibia) and their absolute timing

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The Neoproterozoic Kaoko Belt in Namibia is classical example of lower to middle crust transpressional orogeny developed between attenuated Congo Craton margin and the Coastal Terrane. The transpression has been described as a two phase event of early oblique thrusting followed by sinistral wrench shearing on the same foliation planes rotated into the subvertical orientations (e.g.
Goscombe et al., 2003). Konopásek et al. (2005) argued that early fabric is not rotated, but intensely folded and the wrench stage operates on newly developed foliation parallel to axial planes of these folds. Three structural profiles across the Coastal Terrane, the Boundary Igneous Complex and the Orogen Core derived from the Congo Craton have been studied in order to assess mechanism of transpression and evaluate absolute timing of individual deformation events. The oldest known subhorizontal Si fabric occurs in the Coastal Terrane only, and is inherited from a pre-collisional HT-LP event dated at 650-630Ma. The S1 fabric occurs in all tectonic units, it is gently dipping to the W-SW and contains subhorizontal stretching lineation. Temperature as well as intensity of its development decreases westwards from penetrative granulite facies fabric in the Orogen Core to lower amphibolite facies axial plane cleavage in the Coastal Terrane. Associated kinematic criteria as S-C fabric in deformed granitoids of the Boundary Igneous Complex show very oblique, top-to-the-SE-oriented thrusting to sinistral shearing. Superimposed subvertical S2 fabric developed in axial planes of upright isoclinal folds, almost homogeneously reworking S1 fabric in the Orogen Core, whereas in the Boundary Igneous Complex and the Coastal Terrane, the S2 fabric is developed with increasing intensity from south to north. Temperature conditions of S2 development decrease westwards. Stretching lineations developed on S2 planes show the same orientation as those on the S1 planes and kinematic indicators associated with D2 structures suggest sinistral shearing. The maximum age of D2 deformation phase is dated at 550 Ma, which is the age of partial melt extracted from S1 fabric into S2 cleavage in the Orogen Core. Common orientation of stretching lineation and solid-state reworking of both S1 and S2 planes suggest single event of sinistral transpression with strain partitioning into very oblique thrusting (S1) and sinistral wrench-style dominated domains (S2). The transpression started at 550 Ma and described strain partitioning and fabric transposition during transpression reflects shape of underthrusted Congo Craton.

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