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Lithospheric scale shear belts in Central Tanzania: From Paleoproterozoic island arc to Neoproterozoic collision

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Shear belts in Central Tanzania formed by two different processes, during accretion of Paleoproterozoic island arcs and later, by Neoproterozoic collision between West and East Gondwana. The geometry of both types of shear belts is strongly governed by the shape of the Archean Tanzanian Craton and response of displacement partitioning along a curved rigid continental margin. Paleoproterozoic convergence between the Archean Tanzanian and Zimbabwe Cratons led to extraction of melts in intervening island arcs amalgamating to the Usagaran/Ubendian orogenic belt. The Craton served as a rigid indenter with a subduction zone along the eastern Tanzanian Craton margin. Coevally, a large dextral strike-slip belt (Tungamalenga Shear Belt) evolved along the southern Craton margin in the stress shadow of the Craton. Coeval emplacement of large volumes of syn-tectonic granitoids softened the crust and facilitated distributed shear across the whole Paleoproterozoic orogen belt. Paleoproterozoic structures acted as stress guide during Neoproterozoic continental collision between West- and East Gondwana fragments. The hundreds of kilometres long Central Tanzanian Shear Belt (CTSB) evolved parallel to the southern margin of the Tanzanian Craton and reactivated parts of the Tungamalenga Shear Belt. A continuous gradient in syn-tectonic metamorphic conditions is recorded along strike of the CTSB. Deformation at shallow crustal levels is dominant in western portions of the shear belt with brittle deformation mechanisms associated with highly localized and partitioned shear. Central portions exhibit subgrain and grain boundary migration deformation mechanisms and distributed shear. Diffusion processes in the East are compatible with lower crustal shear at granulite facies metamorphic conditions. The CTSB clearly separates domains of

different tectonic style within the Neoproterozoic Mozambique Belt. Thrust tectonics with forward and upward propagation of thrusts is recorded north of the CTSB. Strike slip deformation acted at different crustal levels south of the CTSB. The flow line geometry within the southern shear domain is attributed to crustal scale counterflow around the curved rigid foreland. In summary both shear belts are interpreted by partitioned displacement along a curved continental margin. This study is supported by FWF-P15599