Nd and Sr Isotopic Investigation of the Archean–Proterozoic Boundary in North Eastern Tanzania: Constraints on the Nature of Neoproterozoic Tectonism in the Mozambique Belt

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Abstract
A Nd and Sr isotopic transect across the Mozambique Belt in northern Tanzania shows that, apart from the granulite terranes in the east, the belt is composed of reworked Archean crust which show TDM ages ≥~2.5 Ga, similar to those obtained from the Tanzania Craton. Evidence for post-Archean crust is limited to the Eastern granulites which yield TDM ages of 1.0–1.1 Ga. Typical Pan African biotite Rb–Sr cooling ages of ~650–490 Ma are found across the entire belt right up to the craton margin. The strong age gradient recorded by the biotite dates is interpreted as indicating diachronous cooling across the belt with the western parts cooling below ~300°C up to ~150 Ma earlier than the eastern parts. The oldest biotite ages (648±14 Ma), from near the western margin, provide the best minimum estimate for the age of the pervasive amphibolite facies metamorphism that characterises the Mozambique Belt. If the metamorphism and deformation in the belt are a result of a continent–continent collision between West and East Gondwana, then this collision must have occurred prior to ~650 Ma.

Keywords
Mozambique Belt;
Tanzania Craton;
Palaeoproterozoic;
Nd and Sr isotopes