Deformation pattern of the NW terrane boundary of the Eastern Ghats Mobile Belt, India: A Tectonic Model and correlation with East Antarctica.

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Abstract

The terrane boundary between Mesoproterozoic - granulitic Eastern Ghats Mobile Belt with the Archaean cratons of east coast of India is demarcated by two kilometer wide ductile shear zone in addition to the break in metamorphic grade, gravity anomaly and emplacement of alkaline rocks. The detailed study of the above Terrane Boundary Shear Zone reveals overthrusting of the Eastern Ghats on the craton by nearly 4.0 km. Further, the thrust is associated with large lateral ramp structure and wrench which have contributed to the salient geometry of the Eastern Ghats front in the NW part of the belt. The thrusting is post kinematic to the granulite facies metamorphism and main folding in the Eastern Ghats and has been dated to be 1.5 Ga on the basis of the age of the synkinematic nepheline syenite dykes. Besides, the Eastern Ghats possess a number of internal thrust sheets synthetic to the frontal thrust for which it has been compared with a fold thrust belt. The thrusting is assumed to have taken place immediately after folding and metamorphism. Hence, this part of the belt is likely to show high temperature decompression similar to those reported from other parts. The association of isobaric cooling in some other parts of the belt has been explained by applying the fold-thrust model where the Eastern Ghats has been presumed to have an overthickened crust. Further, the Terrane Boundary Shear Zone has been equated with the Rayner-Napier boundary in the correlation of Eastern Ghats with Enderby Land.