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Superchron

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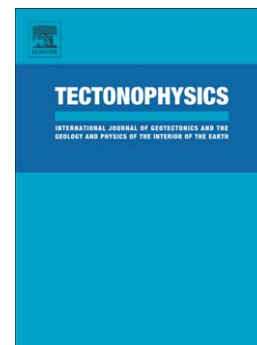
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Middle Permian paleomagnetism of the Sydney Basin, Eastern Gondwana: testing Pangea models and the timing of the end of the Kiaman Reverse Superchron

Belica, M.E., Tohver, E., Pisarevsky, S.A., Jourdan, F., Denyszyn, S., George, A.D.

Abstract

Paleomagnetic and geochronologic data from the eastern margin of Gondwana have been obtained from the Gerringong Volcanics in the southern Sydney Basin, Australia. The corresponding paleomagnetic pole at 56.9°S, 154.8°E ($N = 131$; $A_{95} = 9.1^\circ$) has a $^{40}\text{Ar}/^{39}\text{Ar}$ plagioclase plateau age of 265.05 ± 0.35 [0.46] Ma from the Bumbo Latite, and overlaps with recent radio-isotopic and paleomagnetic results published from Western Gondwana. The long-documented inconsistency between Middle Permian Eastern and Western Gondwanan paleomagnetic datasets is most likely an artefact of a lack of reliable paleomagnetic data from Eastern Gondwana for this period. A number of well-dated and recently published ca. 265 Ma paleomagnetic results from Gondwana and Laurussia are shown to be consistent with the Wegenerian Pangea A configuration, with a loose N-S fit of the continents for the Middle Permian. The lack of crustal overlap negates the need for a Pangea B configuration, which if valid must have been assembled to Pangea A by ca. 265 Ma.

The reverse polarity Bumbo Latite was sampled from the Kiaman type-section located in the southern Sydney Basin. Three cases of normal polarity were detected in the overlying Saddleback, Dapto, and Berkeley Latites, previously assigned to the Kiaman Reverse Superchron (KRS). We review KRS-aged magnetostratigraphic data and propose that an age assignment of 265 Ma most likely represents the termination of the non-reversing field, with longer stable intervals of normal polarity recorded and able to be correlated globally.

Keywords: Paleomagnetism; Gondwana; Magnetostratigraphy; Permian; Superchron; Pangea

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