

A revised Rodinia supercontinent: no SWEAT, no AUSWUS

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Abstract

Although geological comparisons between Australia and North America have provided a basis for various Neoproterozoic Rodinia reconstructions, quantitative support from precisely-dated paleomagnetic poles has so far been lacking. We report U-Pb ages and paleomagnetic results for two suites of mafic sills within the intracratonic Bangemall Basin of Western Australia, one of which is dated 1070 ± 6 Ma and carries a high-stability paleomagnetic remanence. The Bangemall paleopole indicates that previous reconstructions of eastern Australia against either western Canada or the western United States are not viable at 1070 Ma. This implies that the Pacific Ocean did not form by separation of Australia-Antarctica from Laurentia, and that up to 10,000 km of late Neoproterozoic passive margins need to be matched with other continental blocks within Rodinia. Our results allow a new reconstruction of northeast Australia against southernmost Laurentia, forming the core of a revised Rodinia configuration.