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Enigmatic Paleopositions of South China in the Rodinian and Gondwanan Reconstructions: New paleomagnetic constraints

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The paleogeographic relationship between South China and Australia in the Gondwanan frame is important for understanding both the positions of South China in the Rodinia configuration and the dispersion of Gondwana and the accretion of the Asian continent. There is a general consensus that the South China Block (SCB) had a strong faunal affinity with eastern Gondwana during the early Paleozoic. However, there is significant debate on the paleopositions of the SCB in Rodinia and Gondwana, in terms of whether it occupied a position on the margin of NW Australia in the Neoproterozoic [1,2] or from the Neoproterozoic to the early Paleozoic [3,4], or whether it migrated from the center of Rodinia to a position external to Gondwana during the Neoproterozoic to the early Paleozoic [5,6].

To better constrain the paleoposition of South China, we have carried out a new paleomagnetic study from the Neoproterozoic Liantuo and Doushantuo Formations in Yichang areas, and late Early Ordovician in northern Kunming areas, and the Late Ordovician in Wangcang County, south China.

Systematic paleomagnetic and rock magnetic studies were carried out to separate multiple magnetizations of the rocks. High-quality paleomagnetic results, with positive reversal and fold tests, are obtained from the Liantuo (720Ma) and Doushantuo Formations (590Ma?), late Early Ordovician (476Ma) and Late Ordovician (455Ma) for the Yangtze Block. Combining these new results with available key poles of Late Cryogenian (Nantuo pole, 635Ma) middle Cambrian (510Ma) and Silurian (428Ma), a new apparent polar wander path (APWP) is established for the Yangtze craton, which is used to

compare the counterpart from the east Gondwana and/or Australia. The comparison implies that the South China block was located to the northwest of Northern Australia during the Ediacaran period. Subsequently, the South China block moved to the northwest of Western Australia through counter-clockwise rotation of the Northern Australian craton at the later time of 550 Ma, or in the middle Cambrian, and maintained its relationship by the Devonian period.

References:

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