

WANG Tiantian, ZHANG Shihong and Jahandar RAMEZANI, 2016. Age Recalibration of the Xiaofeng Dykes, South China, and Its Implications for True Polar Wander at ~820 Ma. *Acta Geologica Sinica* (English Edition), 90(supp. 1): 47.

## Age Recalibration of the Xiaofeng Dykes, South China, and Its Implications for True Polar Wander at ~820 Ma

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Paleomagnetism of the Neoproterozoic Xiaofeng dykes exposed in the Three Gorges region of Hubei Province bear important implications for the paleogeography of the South China block (SCB). New high-precision U-Pb geochronology by the chemical abrasion isotope dilution thermal ionization mass spectrometry (CA-ID-TIMS) places the dykes at 821.64 Ma to 821.10 Ma with  $2\sigma$  internal uncertainties of ca. 0.2 Myr. These emplacement ages are almost 20 million years older than the previously published dates from both sensitive high-resolution ion microprobe (SHRIMP) and laser ablation inductively coupled plasma mass spectrometry (LA-ICP-MS) techniques. The Xiaofeng paleomagnetic data place the SCB in very high paleolatitudinal region at ~821 Ma (Li et al., 2004). In conjunction with some reliable paleomagnetic poles from the Yanbian dykes (~824±6 Ma) and Liantuo Formation (~780-720 Ma), the true polar wander (TPW) hypothesis has been proposed to interpret the large discrepancy among the paleomagnetic data (Li et al., 2004; Niu et al., 2015). Our new geochronological results reinforce existing evidence for the TPW speculation and place tight constraints on a TPW event that occurred between 830 and 818 Ma (likely between 824 and 821 Ma). This TPW event is significantly older than the Bitter Spring stage TPW event (Maloof et al., 2006) whose occurrence has been well constrained between 812 and 788 Ma (likely between 808 and 795 Ma) based on recent analyses (Swanson-Hysell et al., 2015). Considering our best estimates for the SCB

paleogeographic position in the supercontinent Rodinia, we suggest that the TPW obtained from the Xiaofeng and Yanbian dykes represent a separate event prior to the Bitter Spring stage TWP event. They together imply that multiple oscillating TPW events might have occurred when a large part of Rodinia was located in the polar region.

### References

- Li, Z. X., Evans, D. A. D., Zhang, S., 2004. A 90 spin on Rodinia: possible causal links between the Neoproterozoic supercontinent, superplume, true polar wander and low-latitude glaciation. *Earth and Planetary Science Letters*, 220, 409-421.
- Maloof, A., Halverson, G., Kirschvink, J., Schrag, D., Weiss, B., and Hoffman, P., 2006. Combined paleomagnetic, isotopic and stratigraphic evidence for true polar wander from the Neoproterozoic Akademikerbreen Group, Svalbard, Norway: *Geological Society of America Bulletin*, 118, 1099-1124.
- Niu, J., Li, Z.-X., Zhu, W., 2015. Paleomagnetism and geochronology of mid-Neoproterozoic Yanbian dykes, South China: implications for ca. 820–800 Ma true polar wander event and the reconstruction of Rodinia. In: Li, Z.-X., Evans, D.A.D., Murphy, J.B. (eds), *Supercontinent Cycles Through Earth History*. Geological Society, London, Special Publications, 424. First published online December 10, 2015, <http://doi.org/10.1144/SP424.11>.
- Swanson-Hysell, N. L., Maloof, A. C., Condon, D. J., Jenkin, G. R. T., Alene, M., Tremblay, M. M., Tesema, T., Rooney, A. D., Haileab, B., 2015. Stratigraphy and geochronology of the Tambien Group, Ethiopia: Evidence for globally synchronous carbon isotope change in the Neoproterozoic: *Geology*, 43, 323-326.

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