Grenville-age magmatism in Bainaimiao, northern margin of the North China Craton: Evidence from captured zircons of quartz-diorite dikes

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The location of the North China Craton (NCC) in the Rodinia supercontinent is still controversial [1-3], due to a lack of precise and convinced geochronological data about Grenville tectono-thermal event. In this paper, we present LA-ICP-MS zircon U-Pb data for a newly discovered Mesoproterozoic magmatic event in the Bainaimiao complex of northern margin of the NCC and discuss their implications.

The quartz-diorite dikes intruded the Ordovician Xuniwusu Formation. All zircons show typical magmatic zones without inherited cores as revealed by CL imagines, indicating their magmatic origin. Fifteen zircon grains from a quartz-diorite dike give concordant U-Pb ages, but disperse from 1.9 to 0.46Ga. We interpret the youngest age of 0.46 Ga to represent the emplacement age of the dike, but others are captured magmatic zircons. Seven out of fifteen zircon grains give concordia $^{207}Pb/^{206}Pb$ ages around 1.26 Ga, with a mean age of 1260±24 Ma (MSWD=0.14), implying that the Mesoproterozoic Grenvill-age magatism took place in the northern margin of the NCC. Our results provide important constraints on the relationship and location between the NCC and other blocks in the reconstruction of the Rodinia supercontinent.

[1] Zhai (2001) *Gondwana Research* **4,** 838-839. [2] Zhao *et al.* (2004) *Earth Sci. Rev*. **67**, 91-123. [3] Wild *et al.* (2002) *Gondwana Research* **5**, 85-94.

Variability of summer coastal upwelling at the northern South China Sea for nearly 100 Years

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Coastal upwelling is of large economic importance and could strongly influence atmosphere-ocean CO_2 exchange, as well as carbon recycling. However, we have very limited knowledge on the long term variations of upwelling in the South China Sea (SCS) due to limited observations. Here we present a high resolution Sr/Ca records (1906-1996) from a *Porites* coral at the east coast of Hainan Island (19°20′N, 110°39′E), at one hot spot area of the northern coast summer upwelling in the SCS. The average value of the reconstructed summer SST by the use of Sr/Ca series is significant lower than instrumental SST from non-upwelling areas. In summer the SSTs of non-upwelling areas are nearly uniform across the SCS. Thus it is possible to use temperature difference between upwelling and non-upwelling areas to assess the variability of upwelling intensity: the larger of temperature difference, the stronger of upwelling. Xisha area (16°50′N, 112°20′E) is located at the middle of the SCS, far away from the land, is an ideal non-upwelling site. We use the SST record from a coral at Xisha minus the reconstructed SST in this study to generate an annual index of upwelling intensity. This index demonstrates that the summer upwelling showed a general strengthening trend from 1906-1993 with significant fluctuation on inter-annual and decadal scales which is consistent with the globe sea-atmosphere temperature change in the 20th century, indicating thermal difference between the land and the adjoining sea areas is strengthening in summer.

This work was supported by the grants of KZCX2-YW-318 and No.40676069.