

# **Recognition of early Neoproterozoic alkaline magmatic event along the NW Yangtze margin, South China**

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Mantle-derived carbonatites are commonly associated with Si-unsaturated alkaline igneous suites, and typically found within stable continental terrains formed by rift-related magmatism. South China has long been thought to have been unified by an amalgamation between the Cathaysian and Yangtze blocks during the mid-late Neoproterozoic. However, there is increasing evidence inferring that the unification of South China comprises multiple marginal collisions among subcontinental terrains, typical of accretionary orogen. Here we report a newly dated alkaline igneous complex associated with carbonatite intrusions occurring along the NW margin of the Yangtze block, expecting to enhance our understanding of the amalgamation history of South China and its relationship with Rodinia assembly and break-up.

The alkaline complex, located at the Pinghe area, NE Sichuan province, lithologically comprises urtite, ijolite and jacupirangite. Zircons from two urtite samples give U-Pb ages of  $873 \pm 3$  Ma and  $874 \pm 10$  Ma, respectively, which are explained as the timing of alkaline magmatism and evidently older than the previously documented ages ranging from the end Neoproterozoic to early Paleozoic by Rb-Sr and Sm-Nd methods. The alkaline rocks are geochemically featured by LREE-enriched pattern with weak negative Eu anomalies, and variable extents of depletion in Nb, Ta, Ti and P. They display  $\epsilon_{\text{Nd}}$  values varying mostly from -1.54 to +1.50 with one urtite sample of -5.58. These characteristics suggest a previously metasomatised mantle source, which agree with their oxygen and carbon isotopic composition of calcite minerals inferring continent-derived carbonatic component.

Some ~950-900 Ma arc-volcanic and ~865-860 Ma back-arc related magmatism have been reported along the NW margin of the Yangtze block. The switches in tectonic setting from compression to extension and returning to compression, along with lateral migrating of regional arc-related magmatism, suggest that the unification of South China comprised a set of marginal accretions, typical of an accretionary orogen, rather than a traditional view of the Yangtze and Cathaysian collision.