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Tectonic evolution of South China in Pre-Pangea time

Jinlong Yao (1,2), Liangshu Shu (2), Peter Cawood (3,4), and Guochun Zhao (1)

(1) Department of Earth Sciences, The University of Hong Kong, Pokfulam Road, Hong Kong, China China (jlyao@hku.hk), (2) School of Earth Science and Engineering, Nanjing University, 210023, China, (3) School of Earth, Atmosphere & Environment, Monash University, Melbourne, VIC 3800, Australia, (4) Department of Earth Sciences, University of St. Andrews, St. Andrews, KY16 9AL, UK

The South China Craton constitutes the Yangtze and Cathaysia blocks and includes an Archean to Proterozoic basement that experienced a prolonged Precambrian and Phanerozoic crustal evolution. The Neoproterozoic Jiangnan orogenic belt is an accretion-collision orogenic belt formed during the amalgamation between the Yangtze and Cathaysia blocks and the arc systems in-between. Early Neoproterozoic arc and trench successions within and adjoining the belt were assembled and deformed, as well as intruded by collisional granitic intrusion, are both covered by middle Neoproterozoic Nanhua rifting successions. Kinematic and structural studies of pre-Nanhua system and ophiolitic belts from different segment of the belt indicate northwest directed structures, confirming northwestward subduction of oceanic crust beneath the Jiangnan belt. Regional angular unconformity between Nanhua system and Pre-Nanhua system marks the first collisional suture between Yangtze and Cathaysia blocks. A synthetic litho-stratigraphic relation, zircon U-Pb dating and Hf isotopes, along with whole rock geochemistry of rock suites in the belt, reveal a prolonged 1000-830 Ma subduction setting for the belt, along with presence of ca. 870-860 Ma fore-arc ophiolitic melange. Coeval arc systems, micro blocks and accretionary intrusions are also recently inferred to constitute the Cathaysia Block. A convergent plate setting throughout this timeframe coincide with supercontinent models that suggest South China located on the periphery of Rodinia. Early Palaeozoic sequences in Cathaysia yield detrital zircon age populations of 2560–2380 Ma, 1930–1520 Ma, 1300–900 Ma, 850–730 Ma and 670–530 Ma, which reveals imprints of a 670-530 Ma tectono-thermal event in the South China Craton that are consistent with palaeobiogeographic evidence from South China. The zircon age traces correlate to late Neoproterozoic–Cambrian orogeny associated with the Gondwana assembly, confirming configuration of South China within Gondwana configuration, possibly on the margin. The tectonic evolution of South China within pre-Pangea supercontinents provides constrains on initial configuration and evolution of Pangea.