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## Early Paleozoic Depositional Environment and Intraplate Tectono-magmatism in the Cathaysia Block (South China): Evidence from Stratigraphic, Structural, Geochemical and Geochronological Investigations

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In order to better understand its early Paleozoic depositional environment, Silurian deformational and magmatic features and the geodynamic processes, we undertook a systematic study of the stratigraphic sequences, deformational features and magmatic activities. Our results show that (1) during the early Paleozoic, the Jiangnan domain in the SE Yangtze block was characterized by a carbonate platform that was distinguished from the graptolite-facies clastic rock assemblage in the Cathaysia block, (2) in the Cathaysia, a littoral-neritic depositional environment occurred in Cambrian whereas a neritic-bathyal setting during the early-middle Ordovician, and (3) the Late Ordovician collapse depositional sequence in Cathaysia witnessed a period of transition from neritic-bathyal to littoral-land environment, marking the initial uplifting process. Paleocurrent measurements on the fore-set bed revealed a northwestward and westward direction, suggesting a source area to the east-southeast. All samples collected from the Cambrian-Ordovician strata show similar chemical characteristics; they have negative  $\varepsilon_{\text{Nd}}(t)$  values (-9.7 to -13.7) and Paleoproterozoic model ages (ca. 2.04-2.36 Ga), suggesting that the early Paleozoic rocks were derived from the eroded Paleoproterozoic basement. Little or no mantle component was identified. During the

Silurian, the Cathaysia block was characterized by strong folding, thrusting, weak metamorphism and large-scale anatexis accompanied by granitoid emplacement, building the South China Fold Belt. Zircon U-Pb dating for the four granitic plutons yielded  $^{206}\text{Pb}/^{238}\text{U}$  ages of  $435 \pm 4$  Ma,  $424 \pm 5$  Ma,  $428 \pm 3$  Ma and  $427 \pm 2$  Ma. All the  $\varepsilon_{\text{Hf}}(t)$  values of the zircons are negative (-6 to -9) and show a peak of two-stage Hf model ages around 1.9 Ga, indicating that the Silurian granitic magma was derived from the recycling of Paleoproterozoic basement. We have observed some notable features of the early Paleozoic South China Fold Belt, such as, the lack of early Paleozoic ophiolites and volcanic rocks, the absence of coeval HP-type blueschists, and the absence of mantle-derived juvenile magmatic rocks. Consequently, a subduction-collision-type orogeny can be excluded. The magmatism most probably took place in intraplate tectonic settings with little or no input of mantle components. The South China Fold Belt was an intraplate orogen, as a response to the global early Paleozoic assembly event.

**Key words:** Depositional sequence, Intraplate magmatism, Geodynamic evolution, Early Paleozoic, South China Fold Belt.

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