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Timing constraints on the convergent of Paleo-South China Ocean and the assembly of the Yangtze Block and Cathaysia Block

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The South China Block is built up by the assemblage of the Yangtze and Cathaysia blocks along the Jiangnan Orogenic Belt. The timing of the Jiangnan orogeny remains controversial. In order to solve this problem, we have taken the widespread orogeny-related Neoproterozoic angular unconformity as study target because it separates the underlying well deformed Sibao group and overlying gently folded Danzhou group above. We collected sedimentary samples from both below and above the unconformity in three localities: Fanjingshan, Guizhou Province, Madiyi, Hunan Province and Sibao, Guangxi Province. The well deformed Sibao group is intruded by numerous peraluminous granitic plutons at ca. 830 Ma. In the laboratory, we realised detrital zircon U-Pb dating on six samples. Totally, we got 489 ages, ranging from 779 ± 16 Ma to 3041 ± 30 Ma, mainly distributed from 800 Ma to 1000 Ma, with an obvious peak at 852 Ma and two minor peaks at 795 Ma and 940 Ma. The youngest ages of 831 ± 11 Ma and 779 ± 16 Ma are revealed for the underlying Sibao and overlying Danzhou groups, respectively. The comparison of newly obtained zircon age spectrums with those from the Yangtze and Cathaysia blocks shows that in the period from 1000 Ma to 865 Ma, the detrital zircon age spectrum of Jiangnan Orogenic Belt is more consistent with that of the Yangtze Block with respect to that of the Cathaysia Block. However, the detrital zircon U-Pb age spectrum of the Jiangnan Orogenic Belt matches well with those of the Yangtze and Cathaysia blocks since ca. 865 Ma. It may suggest that the Paleo-South China Ocean began to subduct under the Yangtze block since ca. 1000 Ma and was completely closed at ca. 865 Ma. Meanwhile, the southeastern margin of the Yangtze Block was in the depositional environment and the Sibao Group was formed. Since the 865 Ma, the Yangtze and Cathaysia blocks started to collide, forming the Jiangnan Orogenic Belt. This collision resulted in the strong deformation in the Sibao Group. The youngest detrital zircon age of the Danzhou Group at ca. 780 Ma may suggest that the collision-related orogeny could be ended before that time.