



## **Structural characteristics of pre-Cenozoic erathem on continental margins of the Southwest Sub-basin, South China Sea and its geological implications**

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**Abstract:** Pre-Cenozoic structural characteristics on the conjugated continental margins, Zhongsha- Xisha block (ZSXS) in the northwest and Nansha block (NSB) in the southeast, of the Southwest Sub-basin is fundamental to understand their tectonic contact relationship before the formation of the South China Sea. Some unpublished and published multi-channel seismic profiles together with published drillings and dredge data were correlated for interpretation. The strata of the study region can be divided into the upper, middle and lower structural layers. The upper and middle structural layers with extensional tectonics are Cenozoic, while the lower structural layer suffering compression is Mesozoic-Paleozoic in ZSXS and Mesozoic in NSB, respectively. These compressional structures were formed mainly in Late Mesozoic Era. Further structural restoration was done to remove the Cenozoic tectonic influence and to calculate the pre-Cenozoic tectonic compression ratios. It is shown that tectonic compression ratios of NNW or NWW orientations gradually increase from the south to the north in the ZSXS and southern NSB. While tectonic compression ratios of SSE orientations southward gradually decrease in the northern NSB. The variations of the compression ratios may be related to a spreading of the proto-South China Sea in late Jurassic to Early Cretaceous (then located in south of the NSB), which probably had pushed the NSB drifted northward and led to a soft collision suture between the ZSXS and NSB. Thus the spreading of the Southwest Sub-basin may have started along suture zone pre-existed between the ZSXS and NSB, which is tectonically weakness zone.

**Key words:** Southwest Sub-basin of the South China Sea, conjugated continental margins, pre-Cenozoic compressive deformation structure, structural restoration, soft collision suture, proto-South China Sea

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**Acknowledgements:** The work was granted by the National Natural Science Foundation of China (Grant Nos. 41476039, 41276048, 41576068 and 91328205) and the Program of Series Atlas on Geology, Geophysics and Geochemistry of Chinese Seas and Adjacent Areas (Grant No. GZH200900504 -WX02).