

THE LITHOSPHERIC DEFORMATION ON THE RIFTING AND BREAK-UP OF THE CONTINENT

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The South China Sea Basin (SCS) is an oceanic basin formed by the seafloor spreading. The Central Basin of the SCS was produced by N-S spreading in 32-17 Ma ago according to the magnetic anomaly data. Therefore, the northern and southern margins are the conjugate-margins that have connected together before the seafloor spreading. We explored the lithospheric structure of the conjugate-margins using deep seismic profiles and found that the upper crust is only 2km thick with 6.0km/s of interval velocity, lower crust is 10km thick with 6.5-6.9km/s of interval velocity in northern margin. There exist NE normal faults and half-grabens in the upper crust, a lot of sub-horizontal reflections in the lower crust, and normal faults in lithospheric mantle of the northern margin. There are many vertical and sub-vertical faults in the upper crust of the Southern margin. For this reason, we believe that the South China margin was rifted and broken-up as follow style. The brittle faults were formed and faulting blocks were rotated along the faulting surfaces in upper crust. The ductile extension was produced in lower crust, and the faults have happened in upper mantle when the lithosphere has rifted; the upper crust has broken-up along the brittle faults, the lower crust has broken-up as the style of bottle-neck, and the lithospheric mantle has broken-up along the normal faults. This is the layered-shear model for lithospheres break-up. Consequently, the southern margin of SCS is the upper plate margin and the northern margin is the lower plate margin.