

## **Cenozoic Volcanism in the Southeast Coast of China and the South China Sea and the Formation of the South China Sea**

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The rock's series, rock type and Sr-Nd isotopic characteristics of the Cenozoic volcanic rocks in the South China Sea are similar to those in the Southeast Coast of China. On the basis of the spreading age of the South China Sea, Cenozoic volcanic rocks are divided into three stages: the pre-spreading stage, the spreading stage and the post-spreading stage. The characteristics of deep processes in the asthenosphere and lithosphere are derived from primary magma. The depth of the top of the asthenosphere in the spreading stage and the pre-spreading stage is shallower than that in the post-spreading stage. From the pre-spreading stage to the spreading stage, the depth to the top of the asthenosphere is decreased, while the amount of interstitial partial melt increased. The evolution of the primary magma shows a progressive evolution sequence of the rifting volcanism and the lithospheric spreading velocity became faster. From the spreading stage to the post-spreading stage, the depth to the top of the asthenosphere increased gradually, while the amount of interstitial partial melt is decreased. The evolution of primary magmas shows a retrogressive evolution sequence of rifting volcanism, and the lithospheric spreading velocity decreased gradually. The deep characteristics showing Cenozoic volcanism are consistent with the opening and closing of the South China Sea, which gives the deep evidence for the formation and evolution of the South China Sea.

**Key words:** Cenozoic volcanism; formation and evolution of

the South China Sea; asthenosphere; lithosphere; Southeast Coast of China