

Characteristics and tectonic implications of the Late Cenozoic magmatic activity in the northern South China Sea continental margin

Shaohong Xia (1), Chaoyan Fan (1,2), Jinlong Sun (1), Jinghe Cao (1), Fang Zhao (1), and Kuiyuan Wan (1)

(1) South China Sea Institute of Oceanology, Chinese Academy of Sciences, Guangzhou, China (shxia@scsio.ac.cn), (2) University of Chinese Academy of Sciences, Beijing, 100049, China

The northern South China Sea continental margin is characterized by extremely unique magmatic activity, with weak magmatic activity during the continental rifting and breakup but intense magmatism during the post-rift stage especially after the cessation of seafloor spreading. The characteristics of magmatic activity in the late Cenozoic are revealed including magmatic scale, material properties, tectonic pattern and channel features by summarizing the previous results of petrology, chronology and geophysics in the northern South China Sea. The results show that (1) the Late Cenozoic basalts in the northern margin of South China Sea show the properties of the ocean island basalts (OIB), and have similar isotopic distribution with the world's typical hotspot OIB; (2) the volume and scale of submarine volcanism in the northern margin of South China Sea are comparable to those of the world's typical igneous provinces; (3) numerous faults formed during the extension and rifting of the lithosphere may provide vertical pathways for the ascent of magma; (4) global and regional seismic tomography results show a clear deep low-speed channel, suggesting that the Late Cenozoic basaltic magmatism in the northern margin of South China Sea may be closely related to the deep mantle plume.

Acknowledgements

This study was supported by the National Natural Science Foundation of China (U1701641 and 41576041).