

Introduction to special section: South China Sea deep structures and tectonics

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The South China Sea (SCS) is one of the largest Cenozoic marginal seas in the Western Pacific region. This oceanic basin was opened from the southeastern edge of the Asia continent under the interaction of the Eurasian, Indo-Australian, and Philippine Sea Pacific plates. Therefore, it provides an exceptional natural laboratory to investigate the genesis of marginal seas and to explore plate-tectonic interactions. It is suggested that the deep structural and tectonic characteristics in the SCS reflect the conditions of the formation and geodynamic evolution of the basin. During the past few decades, numerous geologic and geophysical surveys, including 4.5 international scientific ocean drilling expeditions (Ocean Drilling Program Leg 184 and International Ocean Discovery Program Expeditions 349/367/368/368X), have been carried out in the SCS, which offer new constraints on our understanding of the origin and geologic evolution of the basin. In this special section of *Interpretation*, five contributions are included, with topics covering the characteristics and distribution of the Mohorovicic discontinuity, spreading-related tectonics, transform faulting, and postspreading magmatism and anomalous tectonic subsidence, as well as integrated geophysical data processing, interpretation, and inversion.

Wang et al. describe postrift volcanism and its shallow plumbing system in the Xisha Massif, a minimally

stretched continental block (termed as a continental ribbon). The igneous plumbing system is likely dikes domain, controlled by thin sediments, rifted faults, and thick crust.

Jiang et al. present unique crustal structures across the fossil spreading center of the southwestern SCS. The differences between the southern and northern continent-ocean transition zone on the origin of high-velocity lower crustal layers and faulting styles imply asymmetric continental breakup processes in the Southwest Subbasin.

Liu et al. introduce a combination method to improve the seismic resolution of crustal structures. The authors also interpret the variation in crustal structures from continental rifting to seafloor spreading.

Geng et al. identify the Moho reflections by use of densely distributed seismic profiles covering the entire SCS oceanic subbasins. The characteristics and distribution of Moho reflections have important implications for the seafloor spreading process.

Zou et al. present the characteristics and genesis of the Zhongnan fault zone (ZFZ) through an integrated analysis of multibeam bathymetric and 2D multichannel seismic data. The ZFZ is a large-scale tectonic belt in the SCS oceanic basin, playing an important role in the formation and evolution of the basin.

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