

EGU2020-6350

<https://doi.org/10.5194/egusphere-egu2020-6350>

EGU General Assembly 2020

© Author(s) 2022. This work is distributed under the Creative Commons Attribution 4.0 License.



## Crustal structure across the extinct ridge in South China Sea from OBS receiver functions: insights into the spreading rate and the magma supply prior to the ridge cessation

Ting Yang<sup>1</sup>, Tran Danh Hung<sup>1,2</sup>, Ba Manh Le<sup>1,3</sup>, and Mei Xue<sup>3</sup>

<sup>1</sup>Southern University of Science and Technology, Dept. of ocean science and engineering, Shenzhen, China  
(tyang@sustech.edu.cn)

<sup>2</sup>Department of Geophysics, Hanoi University of Mining and Geology, Vietnam

<sup>3</sup>State Key Laboratory of Marine Geology, Tongji University, Shanghai, China

The characteristics of oceanic crust are dependent on the spreading rate of a Mid-Ocean Ridge (MOR). Crustal structure near an extinct MOR, therefore, provide unique constraints on how the magma supply and the crustal accretion respond to the reduced and ultimately ceased spreading. We present the crustal structure beneath 11 OBS sites near the extinct MOR in the central sub-basin of the South China Sea (SCS). We use the Receiver Function (RF) method to reveal the thickness and the Vp/Vs ratio of the crust based on the passive-source OBS data collected in this sub-basin. The thickness of the crust varies systematically with the distance to the ridge. The thinned crust near the ridge likely indicates that, in the late stage of spreading, the magma supply has diminished and the spreading rate has dropped to the ultra-slow range. While the Vp/Vs ratios at most sites fall into the normal range, there exist a few anomalously high Vp/Vs ratios (> 2.0) at sites very close to the ridge. These high Vp/Vs values can be explained by the serpentinization of the uppermost mantle beneath the sites. As the spreading rate and magma supply were reduced, fractures and fissures were easily developed at the front of the crust accretion, allowing water enters the lowermost crust and serpentinizes the uppermost mantle.