

引用本文:

吕川川, 郝天珧, 丘学林, 赵明辉, 游庆瑜. 南海西南次海盆北缘海底地震仪测线深部地壳结构研究[J]. 地球物理学报, 2011, V54(12): 3129-3138, DOI: 10.3969/j.issn.0001-5733.2011.12.013

LV Chuan-Chuan, HAO Tian-Yao, QIU Xue-Lin, ZHAO Ming-Hui, YOU Qing-Yu. A study on the deep structure of the northern part of southwest sub-basin from ocean bottom seismic data, South China Sea. Chinese J. Geophys. (in Chinese), 2011, V54(12): 3129-3138, DOI: 10.3969/j.issn.0001-5733.2011.12.013

南海西南次海盆北缘海底地震仪测线深部地壳结构研究

吕川川¹, 郝天珧¹, 丘学林², 赵明辉², 游庆瑜^{1*}

1. 中国科学院油气资源研究重点实验室, 中国科学院地质与地球物理研究所, 北京 100029;
2. 中国科学院边缘海地质重点实验室, 中国科学院南海海洋研究所, 广州 510301

A study on the deep structure of the northern part of southwest sub-basin from ocean bottom seismic data, South China Sea

LV Chuan-Chuan¹, HAO Tian-Yao¹, QIU Xue-Lin², ZHAO Ming-Hui², YOU Qing-Yu^{1*}

1. Key Laboratory of Petroleum Resources Research, Institute of Geology and Geophysics, Chinese Academy of Sciences, Beijing 100029, China;
2. Key Laboratory of Marginal Sea Geology, South China Sea Institute of Oceanology, Chinese Academy of Sciences, Guangzhou 510301, China

摘要

参考文献

相关文章

Download: PDF (2024KB) HTML 1KB Export: BibTeX or EndNote (RIS) Supporting Info

摘要 基于2009年和2011年采集的海底地震仪数据, 辅以多道地震数据, 对南海西南次海盆北缘的地壳结构进行了探索. 利用二维射线追踪的反演方法建立测线上的模型. 利用声学基底面的反射波, 下地壳顶界面的反射波和莫霍面的反射波走时的反演勾绘了地层中的不连续界面, 利用自声学基底面下的折射波和来自上地幔的首波来反演整条测线的P波速度结构. 结果发现在下地壳顶界面和莫霍面都出现了较大的起伏, 据此推断西南次海盆的张裂模式, 并得到西南次海盆与非火山型的大陆边缘伊比利亚-纽芬兰的张裂具有一定程度上的相似性的结论. 说明了大陆张裂的两种端元力学模型不能很好的解释西南次海盆的拉张模式, 而应用弹性梁的力学模型可以解释这种拉张模式. 虽然在西南次海盆北部陆坡区的下地壳中没有发现大规模的岩浆活动, 但是得出在莫霍界面上方可能有小规模熔融物质存在的结论.

关键词: 南海西南次海盆 海底地震仪 广角地震 大陆张裂模式

Abstract: Based on the OBS data and the multi-channel seismic data collected in 2009 and 2011, the structure of crust in the north part of Southwest Sub-basin in the South China Sea is explored. Using two-dimensional ray tracing method to establish P velocity model, employing acoustic basement reflection, the reflections from the top interface of lower crust and the Moho are calculated in order to give the location of the velocity discontinuity interfaces. By employing refraction under the acoustic basement and the head wave from the mantle, the P wave velocity structure of the entire survey line is pictured. The results showed that the depths of the top interface of lower crust and the Moho vary significantly. We inferred the southwest sub-basin rifting model, and concluded that there is a similarity in geological structure between the southwest sub-basin of South China Sea and Iberia-Newfoundland which is a typical non-volcanic margin. It is found that the two end-member mechanical continental rifting models could not satisfactorily explain the southwest sub-basin geological structure, while the elastic beam mechanics model can explain this rifting mode. Although in the lower crust of the northern part of southwest sub-basin there isn't large-scale magmatic activity, we inferred that a small amount of molten material may exist on the top of Moho.

Keywords: Southwest Sub-basin in South China Sea Ocean bottom seismometer Wide-angle seismic Lithospheric stretching model

Received 2011-07-19;

Fund:

国家重点基础研究发展计划(973计划)(2007CB4117-01), 自然科学基金项目(41074058)联合资助.

Corresponding Authors: 郝天珧, 女, 1957年生, 研究员, 主要从事海、陆油气盆地综合地球物理研究. E-mail: tyhao@mail.iggcas.ac.cn Email: tyhao@mail.iggcas.ac.cn

About author: 吕川川, 男, 1983年生, 中国科学院地质与地球物理研究所读博士生, 主要从事海底地震学和海洋综合地球物理研究. E-mail: lvchuanchuan@mail.iggcas.ac.cn

链接本文:

Service

把本文推荐给朋友

加入我的书架

加入引用管理器

Email Alert

RSS

作者相关文章

