



IGMT

The extent of igneous rocks of the South China Sea based on the correlational analyses of gravity and magnetic data

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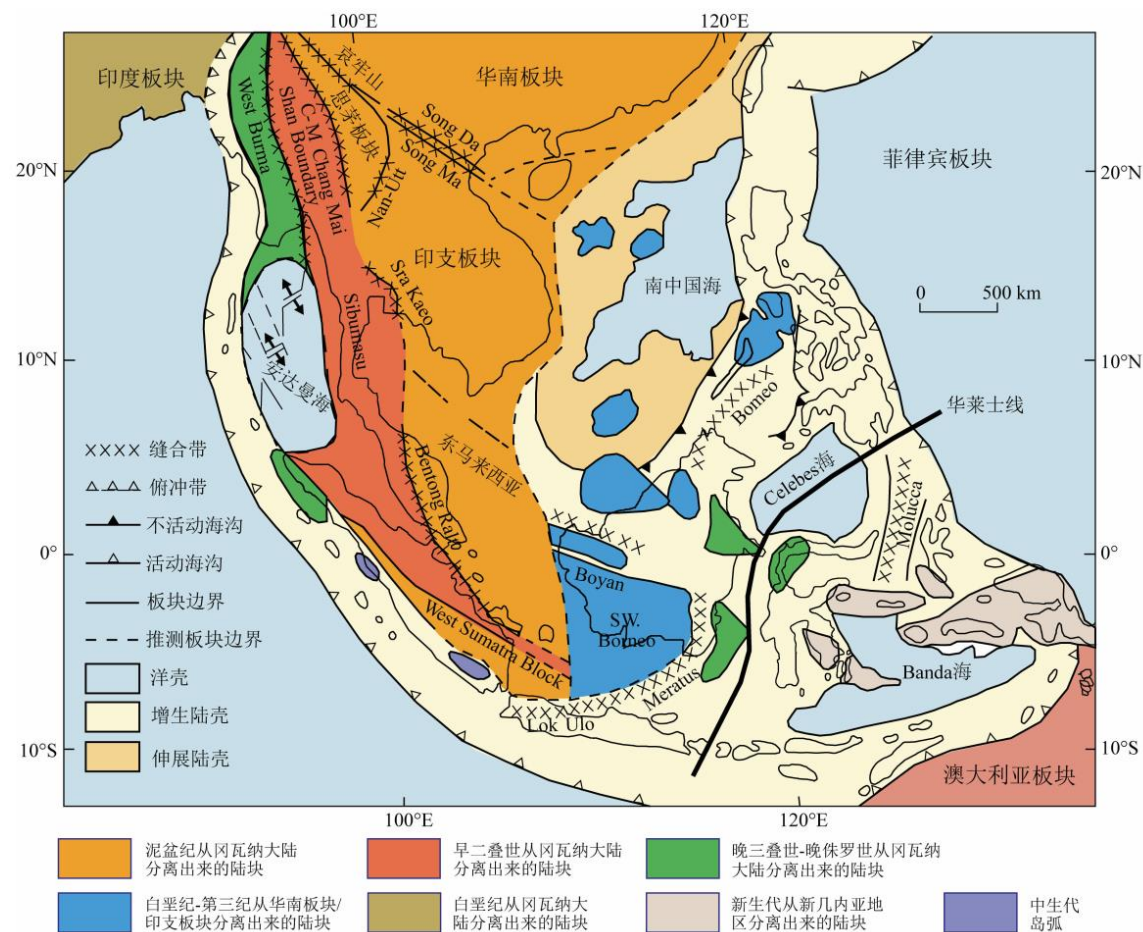
3China Aero Geophysical Survey and Remote Sensing Center for Natural Resources, Beijing,

2020.05.07 (14:00-15:45)



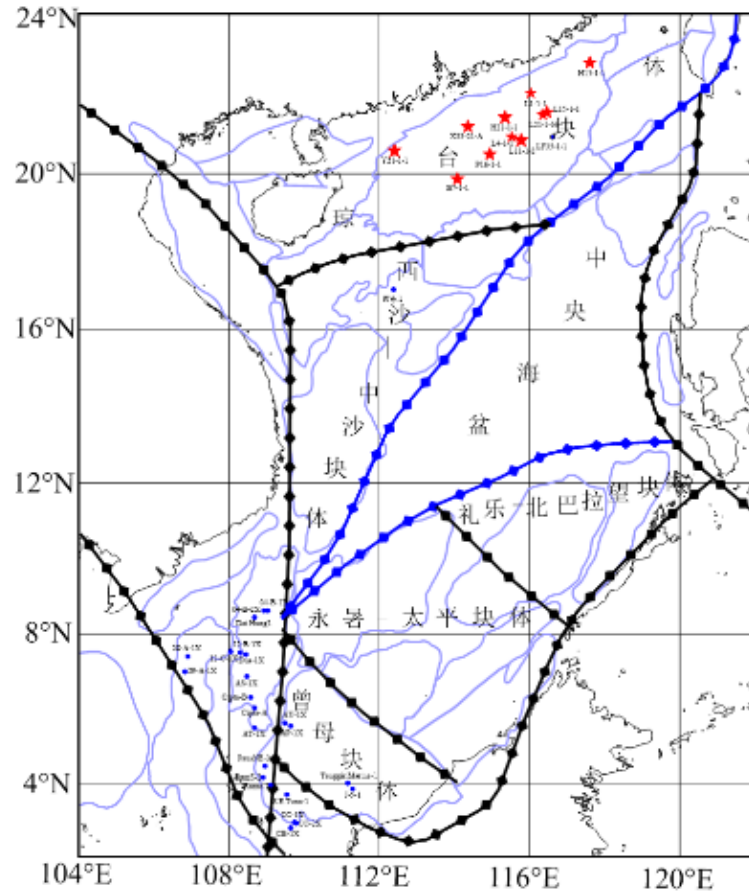
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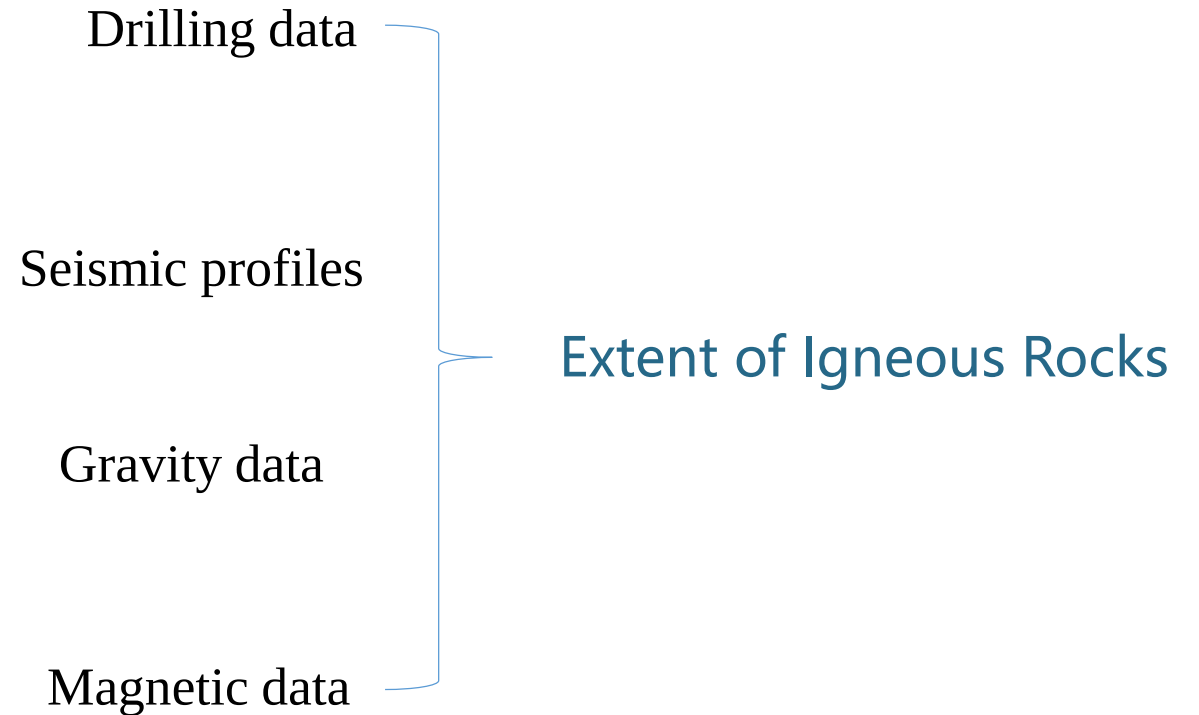
(冯旭亮、张功成和王万银等, 2018)

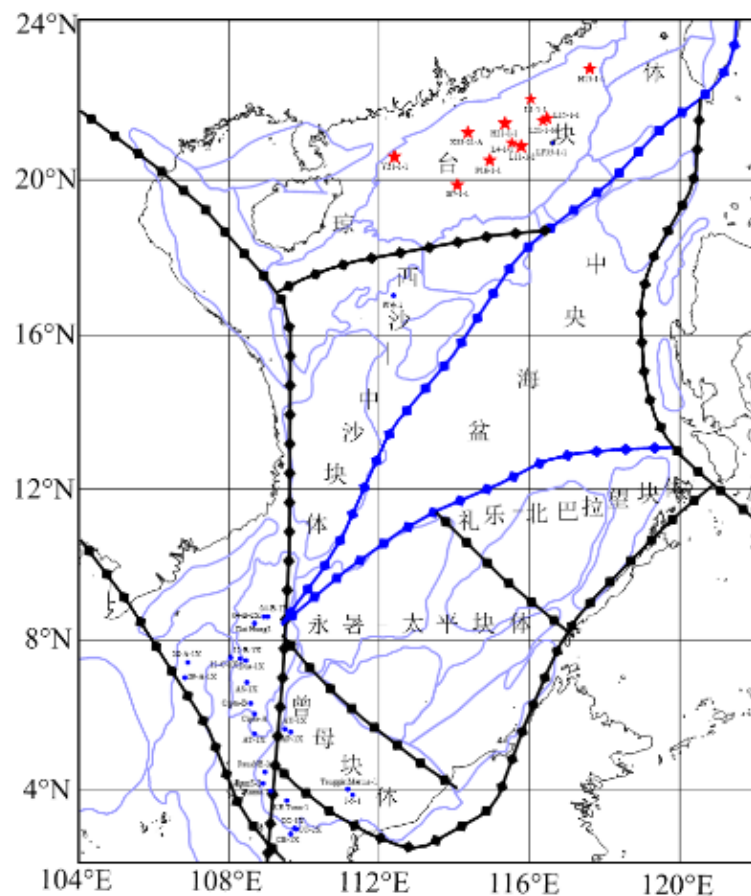
The South China Sea is the biggest conjugate marginal sea in the West Pacific Ocean, which is influenced by the Eurasian plate, the Pacific plate, and the Indo-Australian plate. There have developed continental tectonic margins with different characters after experiencing subduction, collision, strike-slip and so on since the Mesozoic and Cenozoic (Yao et al., 2004; Zhang et al., 2014). However, the igneous rock can be regarded as a recorder to reveal some information of evolution and deep geodynamics of the South China Sea, which helps us to improve understanding of the continental rifting, the seafloor spreading, the formation of deep water basins and the process of hydrocarbon accumulation (Zhang et al., 2016).



Drilling data of SCS

(Stars: Heping Zou et al., 1995;
Circles: Jinlong Xie et al., 2010)



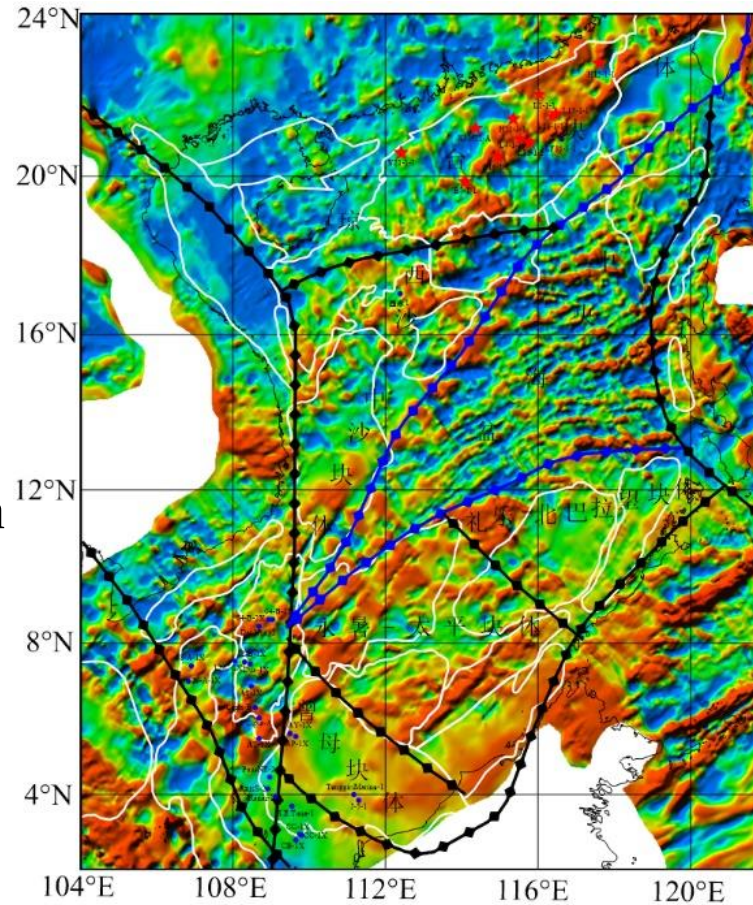


Drilling data of SCS

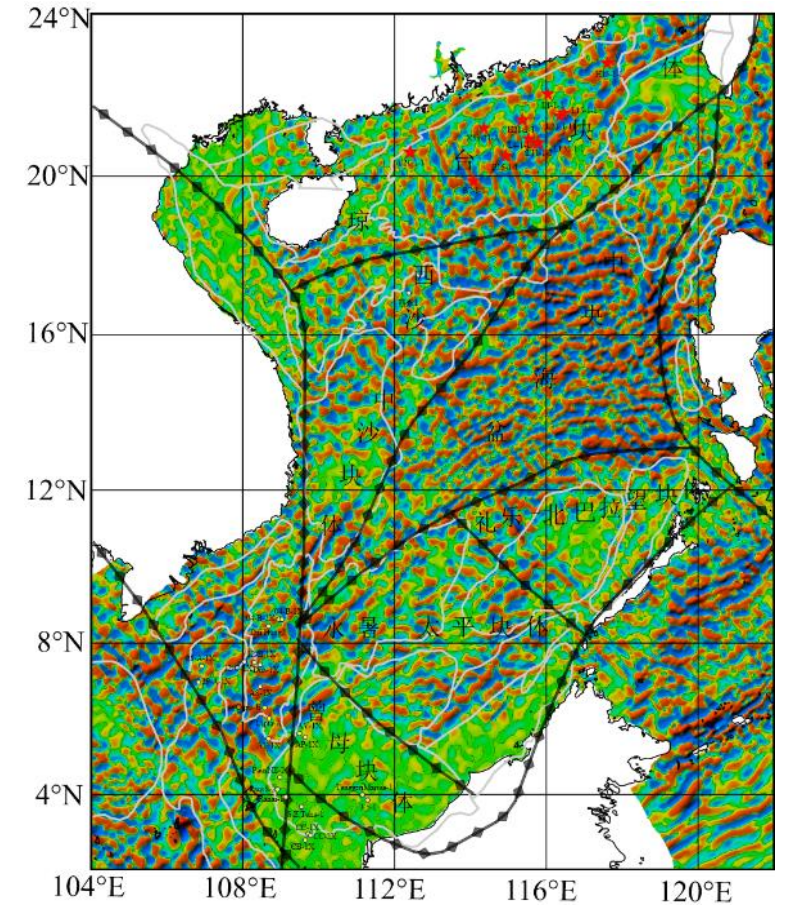
(Stars: Heping Zou et al., 1995;
Circles: Jinlong Xie et al., 2010)

However, the researches related to the south of the South China Sea where the deep-sea are far less knowledgeable about the distribution of the igneous rocks than the north because of the limitation of datasets that are poor quality and less quantity (Yao et al., 2004; Li et al., 2010; Hui et al., 2016), which lead to the less researches with respect to the big area of the South China Sea.

The magnetic data was spliced from the data of CCOP and the magnetic anomaly data of the world. In this study, the process of reduction to the pole was carried out on the spliced data to obtain RTP magnetic anomalies.

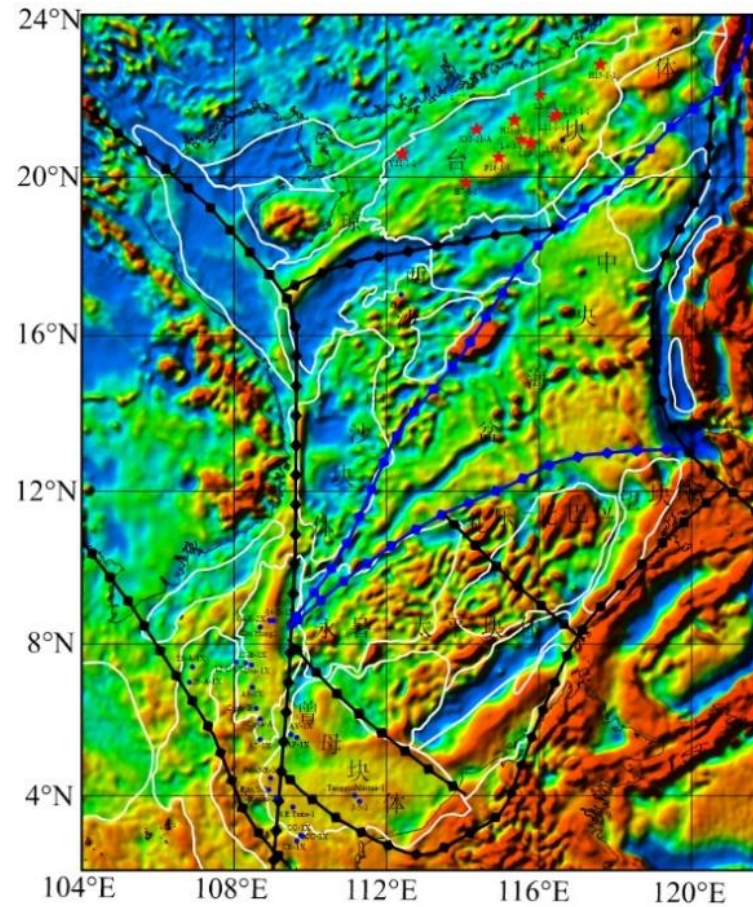


RTP Magnetic anomalies

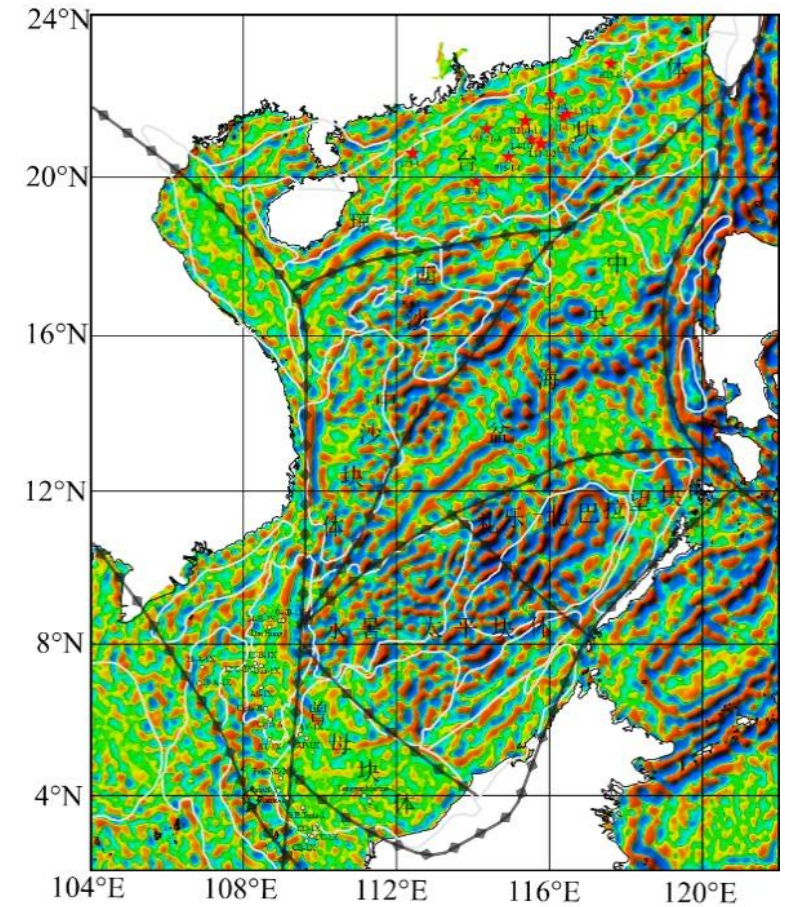


Residual of magnetic anomalies

Satellite gravity data are from the global satellite gravity anomaly database V22.1 maintained by two professors in the United States, Smith W. H. F and D. T. Sandwell.



Satellite gravity anomalies



Residual of Satellite gravity anomalies

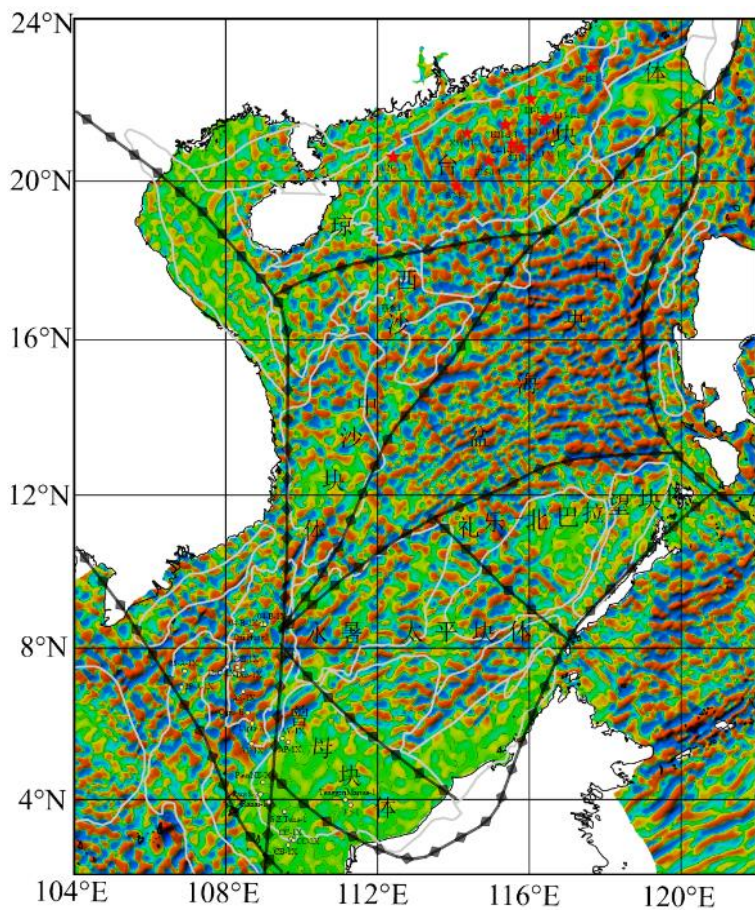
Introduction

Datasets

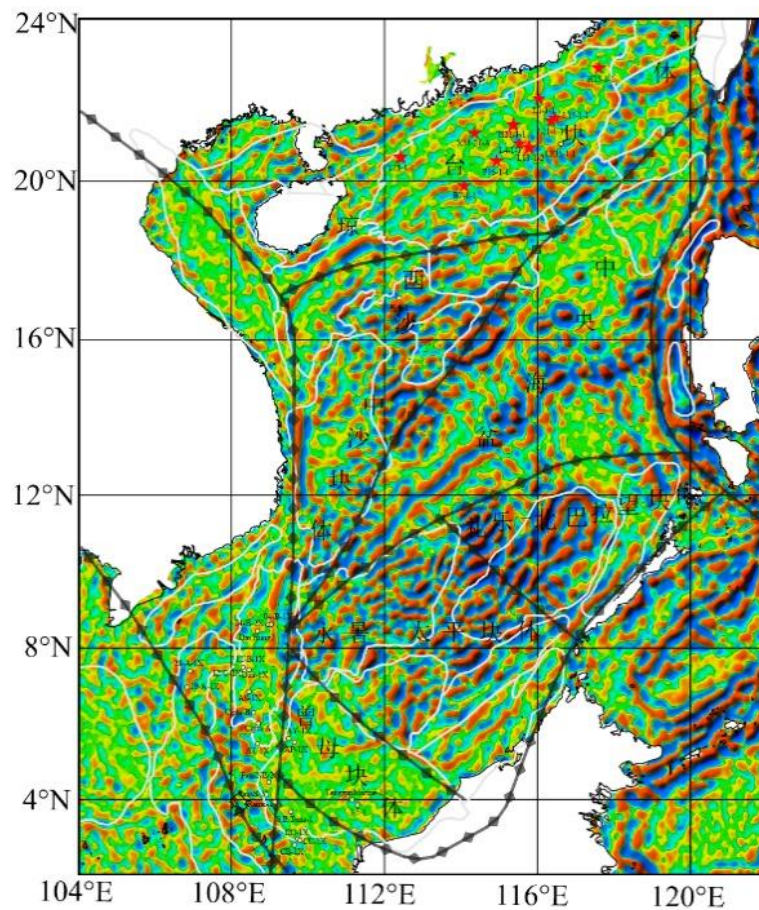
Method

Extent

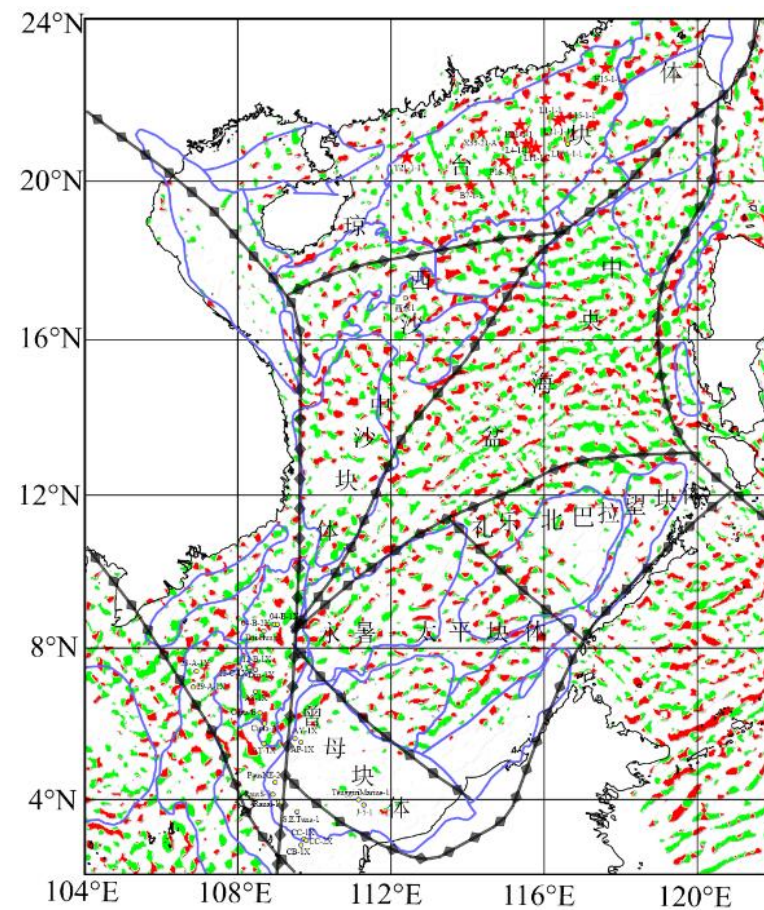
Conclusions



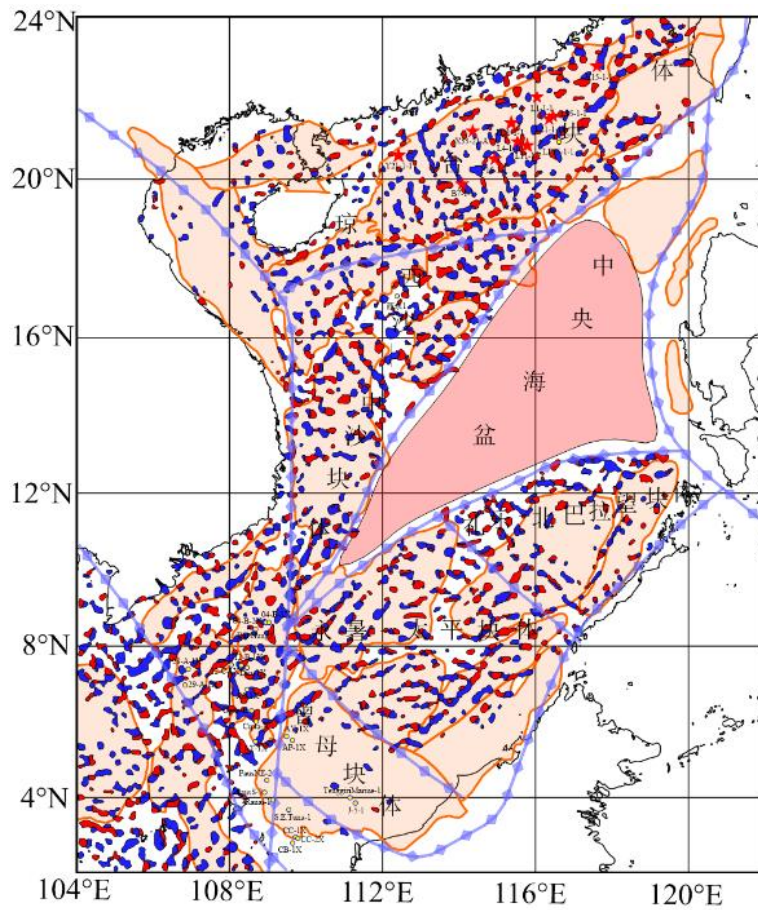
Residual of magnetic anomalies



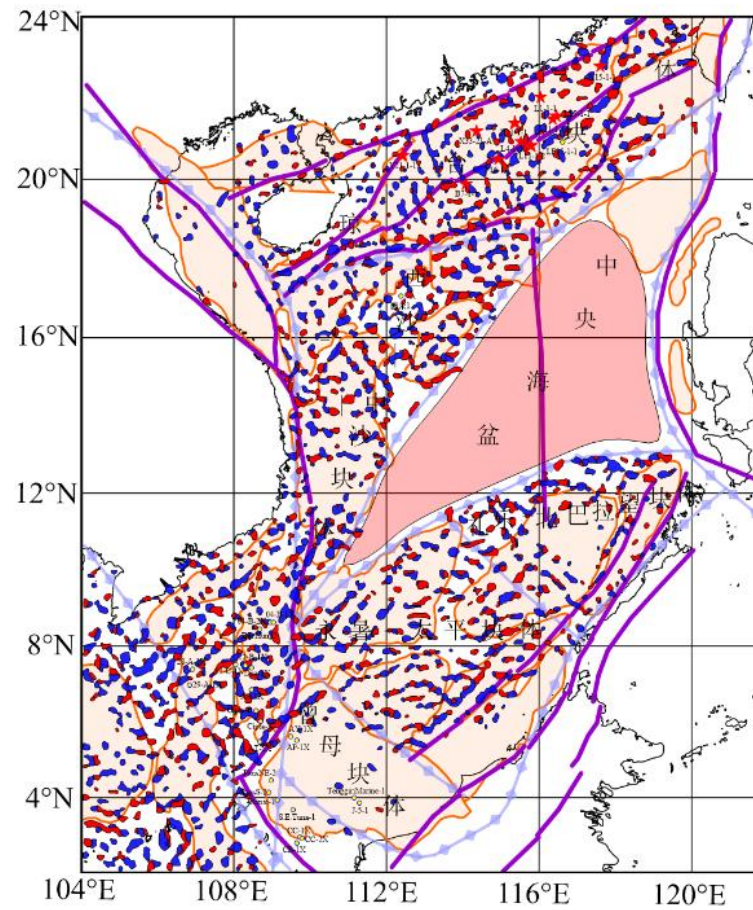
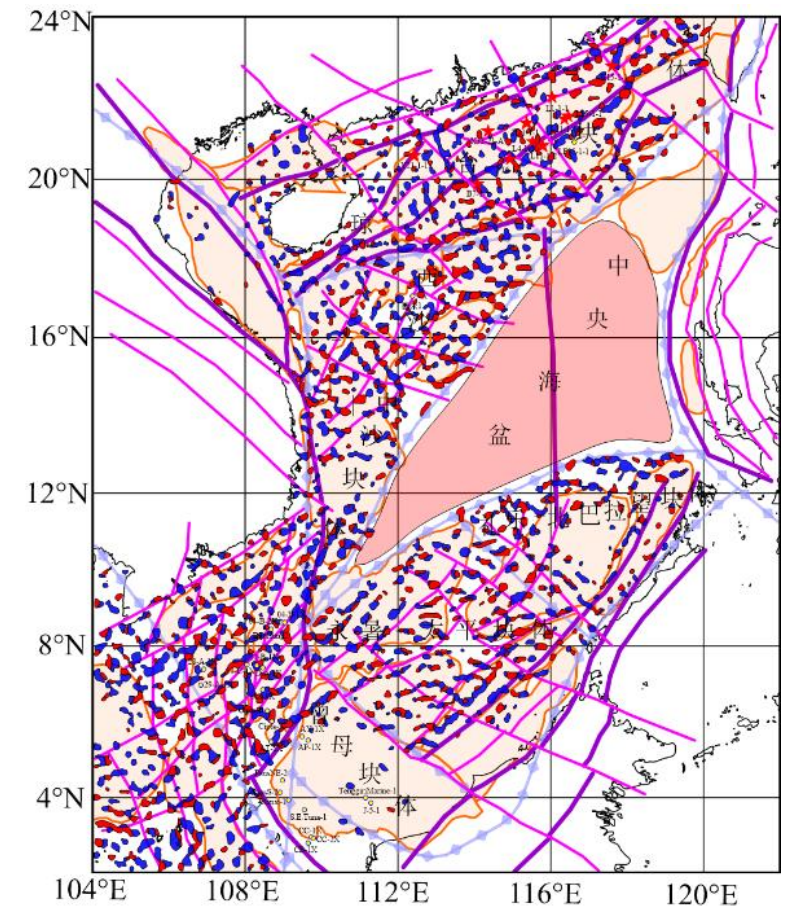
Residual of Satellite gravity anomalies



The fusion figure of residual gravity and magnetic anomalies



Extent of Igneous Rocks

Extent of Igneous Rocks
with Main faultsExtent of Igneous Rocks
with Secondary faults

- Igneous rocks are generally developed in the south China sea and its adjacent areas.
- By comparing the distribution of igneous rocks and the distribution of faults, it is concluded that the distribution of igneous rocks is related to the distribution of faults, especially the deep and large faults, and the volcanic rocks are usually developed at or near the intersection of the major faults. In the south China sea and adjacent areas, NE and NW are the main fault trends, and most igneous rocks are controlled by faults.
- The 3D distribution of igneous rocks in small regions can be characterized by gravity - magnetic joint inversion.



Thank you

