

Paper Number: 997

The application of magnetic amplitude inversion for structure interpretation in South China Sea

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The South China Sea (SCS) is a marginal basin with extremely complicated crustal structure and whose evolutionary history is associated with continental rifting and seafloor spreading in the Cenozoic Era. The magnetic data are among the most important data sets for studying deep crustal structures and the tectonic evolution of this region. However, directly interpreting total-field magnetic anomaly data in the SCS can be difficult because of the complex patterns associated with low-latitude anomaly projection and the presence of remanent magnetization mainly from oceanic basalts. To alleviate these difficulties, we present a strategy by using magnetic amplitude data analyses and associated inversion. The amplitude data, places the anomaly peak approximately over the source bodies and can also be inverted directly to construct the 3D subsurface distribution of magnetization for interpretation of crustal construction and deep tectonics.

The amplitude data inversion results reveal the tectonic divisions, deep faults and sea floor spreading axis in SCS, and further drive us to enhance the understanding of tectonic evolution of SCS. The magnetic amplitude inversion result and its correlation with known geology show that this approach is feasible and effective for structural interpretation in a low-latitude marginal basin with extremely influenced by remanence.

References:

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