Plate Behavior Beneath the High Magnetic Anomaly Belt in Southwestern Taiwan : A Magnetic Model Study

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Abstract

On the magnetic anomaly map of the Taiwan region, along the margin of the Eurasian continental plate, there exists an obvious belt of high magnetic anomaly (HMA) in the southwestern Taiwan region. The HMA belt extends northeastward to the area of the town of Puli in central Taiwan and ends there. By the position of the HMA belt on the tomographic map, the HMA belt should be related to the orogeny of Taiwan. In this paper, we obtained the magnetic basement profiles from inversion of the magnetic anomaly profiles across the HMA belt and then discussed their geological meaning .

We found that the lithosphere to the southeast of the HMA belt should still be part of the Eurasian continental plate, but it dips to the southeast and has been split, probably due to sinking caused by the rifting process of the opening of the South China Sea. The dipping and split lithosphere has then been pushed northwestwards beneath central and southern Taiwan, the greater in degree toward north, caused by the collision of the Philippine Sea plate against the Eurasian continental plate, but this split lithosphere continues to sink due to the formation of the Central Range of Taiwan.

Keywords: High Magnetic Anomaly Belt in Southwestern Taiwan, Inversion of Magnetic Anomaly Profile, Taiwan Orogeny.

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台灣西南高磁帶底下之板塊構造：
磁力基盤模擬研究

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摘　　要

磁力異常圖顯示在台灣的西南部地區沿歐亞板塊大陸棚邊緣有一個高磁帶。此高磁帶向東北延伸至台灣中部，在埔里地區結束。此外，從此高磁帶在地形圖上的位置看來，此高磁帶應與台灣的造山運動有所關連。本論文主要利用近年來在台灣島上所收集的高密度磁力資料，從事此高磁帶附近磁力基盤剖面之逆推工作，並據以探討其地質意義。從所逆推的磁力基盤特性可知，高磁帶東南側仍應屬於歐亞大陸板塊，但因分裂、下沈而向東南下傾。此分裂而下傾之歐亞大陸板塊之邊緣地塊現在受到菲律賓海洋板塊與歐亞大陸板塊的碰撞而在台灣中南部向西北靠攏但被中央山脈擠壓而持續下沈。

關鍵字：台灣西南高磁帶、磁力基盤剖面、台灣造山運動。

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