

南沖繩海槽張裂與台灣東北部伸展構造的關聯性

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摘要

台灣東北部外海的地體架構受沖繩海槽擴張影響，從壓縮環境改變為伸張環境，形成一系列正斷層造成古造山帶垮塌，此造山運動後的垮山機制逐漸從外海向內陸前進。根據前人研究震測與海底線形資料顯示部分正斷層已延伸至近陸地附近，但是否與陸域的斷層有關還值得探討。本研究在鼻頭及龍洞地區野外露頭上觀察到一系列正斷層組成的地壘及地塹，這些正斷層與沖繩海槽擴張相關性為此研究主要探討的目標之一。

台灣東北部陸域為雪山山脈地質的延伸，由數條東北西南走向的區域性斷層及褶皺縱貫於其中，地體構造相對複雜，且有核能廠的建設及鄰近於大台北都會區，這使得瞭解該地區的地質演育日趨重要，本研究將透過無人飛行載具建立三維模型，藉由高解析度正射及立面影像分析裂隙分佈情形，並經野外調查查核及分析，瞭解鼻頭及龍洞地區裂隙關係及趨勢差異，期望能對台灣東北部地質構造演化有進一步的認知。

關鍵字：沖繩海槽、地質演育、裂隙分析、無人飛行載具

The relationship between southern Okinawa Trough rifting and extensional tectonics in northeastern Taiwan

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Abstract

The plate tectonics have been affected by the Okinawa Trough rifting in northeastern Taiwan, which changes the environment from compression to extension, making the collision orogen collapse as a result of normal faulting. The post-collisional collapse is moving from offshore to onshore. According to previous studies, seismic surveys and seabed lineament data show that some normal faults have extended to near land, but it is still an open question whether they are related to the faults in the onshore area. In this study, a series of normal faults with horsts and grabens were observed in the outcrops in the Bitou and Lungtung areas. The correlation between these normal faults and the rifting of the Okinawa Trough is one of the main objectives of this study.

The inland area in the northeastern Taiwan is the geological extension of the Hsuehshan Mountain Range, which is affected by several regional faults and folds trending from the northeast to the southwest. The plate tectonics are relatively complex, in addition to this, the construction of nuclear power plants and the proximity to the Greater Taipei Metropolitan Region, makes it increasingly important to understand the geological evolution of this area. In this study, the three-dimensional model will be established through an unmanned aerial vehicle (UAV), and the distribution of fractures will be analyzed by high-resolution orthoimages and facade images. Based on the field inspection and analysis to understand the relationship and trend differences of fractures in the Bitou and Lungtung areas, this will further improve the understanding of the structural evolution in northeastern Taiwan.

Keywords: Okinawa Trough, structural evolution, fracture analysis, Unmanned Aerial Vehicle (UAV)