

車瓜林斷層的剪切行為

報告者：張育熏

指導教授：黃文正 老師

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摘要

車瓜林斷層位於高雄旗山，呈東北-西南走向，北起高雄內門，向西南延伸經大廓庭山，西南端在燕巢區崎溜以南進入平原區，全長約 25 公里，為第一類活動斷層，目前仍持續發生潛移變形。根據前人研究，發現車瓜林斷層沿線，北段與南段的相對位移行為並不相同，北段顯示相對左移，南段則顯示相對右移，並且大致可將相對位移行為轉換帶縮小到中寮隧道南北不到一公里內。因大地測量結果僅能代表地表的變形，缺乏微構造的證據支持。

前人以斷層泥為樣本進行雙直剪試驗，並透過掃描式電子顯微鏡 (SEM) 觀察微構造，發現片狀矽酸鹽礦物的含量會影響實驗斷層泥的摩擦行為，進而影響斷層泥中的組構，可藉此驗證本研究對剪切構造的解釋。

本研究希望以現地地質調查，採集斷層帶中記錄剪切行為的黑色條帶泥岩樣本，並將其製成薄片，於顯微鏡下觀察剪切構造，辨識其剪切方向，進而了解車瓜林斷層的變形行為。

關鍵字：車瓜林斷層、中寮隧道、岩石薄片、活動斷層

The Shear Sense of the Chegualin Fault

Presenter: Yu-Hsun Chang

Advisor: Prof. Wen-Jeng Huang

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Abstract

The Chegualin Fault is located in Qishan, Kaohsiung, and trends in a northeast-southwest direction. It extends from Neimen in the north, passes southwestward through Dabuting Mountain, and enters the plain area south of Qiliao in Yanchao District at its southwestern end. The fault has a total length of approximately 25 km and is classified as a Type I active fault, continuing to undergo creeping deformation. According to previous studies, the relative displacement behavior differs between the northern and southern segments of the Chegualin Fault. The northern segment exhibits relative left-lateral movement, while the southern segment shows relative right-lateral movement. The transition zone where this displacement behavior changes is estimated to be within a narrow area of less than one kilometer around Zhongliao Tunnel. However, since geodetic measurements only capture surface deformation, there is a lack of microstructural evidence to support these observations.

Previous research conducted double-direct shear tests using fault gouge samples and observed microstructures through a scanning electron microscope (SEM). These studies found that the phyllosilicate mineral content influences the frictional behavior of the experimental fault gouge, which in turn affects its internal fabric. This provides a basis for verifying the interpretation of shear structures in this study.

This study aims to conduct field geological surveys to collect black-banded mudstone samples from the fault zone that record shear behavior. These samples will be made into thin sections for microscopic observation of shear structures to determine the shear direction. Through this analysis, the study seeks to gain a better understanding of the deformation behavior of the Chegualin Fault.

Keywords: Chegualin fault, Zhongliao tunnel, Rock thin section, Active fault.