

A Slope Monitoring Test using Ground-Based SAR Technique

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The Ku-band Ground-Based Synthetic Aperture Radar (GBSAR) and Micro-Movement Imaging (MMI) technologies are conducted in this paper, and field observations were performed at Wufeng Elementary School in Wufeng Township, Hsinchu County, a sensitive area prone to landslides. The sub-millimeter-level micro-displacement was monitored in real-time by conducting scans on June 2nd, July 14th, and August 18th, with a 5-minute interval between each scan. Subsequently, a time-series analysis was performed in a step-by-step manner. During the monitoring period, adjustable radar reflectors were used to validate the accuracy of micro-displacement (2 to 3mm) through on-site observations.

The GBSAR equipment, when properly configured, can be applied for landslide disaster warnings in various conditions, including mine slopes, volcanic activities, road slope engineering, retaining wall projects, and snow avalanche areas. This application aims to reduce the risk of sliding and ensure safety.

Keywords: Ground-Base Synthetic Aperture Radar, Micro Displacement, Slope Monitoring