**Estimation of land deformation using the PSInSAR technique in Taiwan**

Yun-Chiao Chang 1, Kuo-Hsin Tseng 2\*

1 Master’s student, Department of Civil Engineering, National Central University, Taiwan

2 Professor, Center for Space and Remote Sensing Research, National Central University, Taiwan

e112322089@g.ncu.edu.tw

***ABSTRACT***

Persistent Scatterer InSAR (PS-InSAR) is a remote sensing technique that measures ground deformation with high precision. It involves the analysis of long-period Synthetic Aperture Radar (SAR) images taken over time to identify "persistent scatterers", which are stable points that reflect radar signals. PS-InSAR can detect and monitor minimal movements in the ground by tracking the phase changes in these scatterers, making it invaluable for detecting subsidence. Taiwan is a mountainous country in East Asia, located off the southeastern coast of China, known for its bustling cities, advanced technology industry, and rich cultural heritage. However, due to factors such as aquaculture, industrial water usage, irrigation, and even domestic water consumption, as well as excessive groundwater extraction, Taiwan faces issues of land subsidence. Therefore, we utilize ESA's Sentinel-1 data, applying PS-InSAR at the pixel level to monitor several local and structural movements from 2019 to 2023 in Taiwan. Preliminary results indicate severe subsidence in central and southern Taiwan, with sinking rates reaching 4-6 centimeters per year, especially during the drought years.

**Keywords:** Persistent Scatterer InSAR, Land subsidence, Sentinel-1