

# COMPARISON BETWEEN PSI AND GPS DATA: NORTHERN AND SOUTHWESTERN TAIWAN

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**ABSTRACT:** SAR Interferometry had been proved its efficient for detecting crustal deformation over a hundred km wide area. Furthermore, the approach of Persistent Scatterer technique could expand the wide deformation field into time domain, which then provides a mean LOS velocity field during interseismic period.

The Deviation of LOS velocity of each PS point indicates the precision of PSI result, and it relates to ground motions captured in every SAR image frame. Determination of steady and non-steady ground motions then becomes an issue for ensuring the result from PSI processing. In this study, we apply StaMPS/MTI method from Hooper et al. (2007) to process Envisat ASAR images, and generate a mean LOS velocity and a multitemporal time series. Due to the acquisitions of satellite usually have gaps in time, this study involves the continuous GPS time series processed by GAMIT/GLOBK to study a continuous surface deformation.

Our preliminary result from PSI processing includes two cases studies, northern and southwestern Taiwan. The mean LOS velocity field of Northern Taiwan shows a low deviation about 0~1 mm/yr in Taipei basin which is an urban area, but a high deviation up to 4 mm/yr at Chinshan and Ilan and southwestern part of the image frame. Southwestern Taiwan case displays a similar result, but the lowest deviation in the frame is about 1 mm/yr located at Tainan city, and higher deviations are about 7 mm/yr, appearing at southeastern mountain zone of and northwestern coastal of the frame. These two cases show both steady and non-steady motion in time series. Thus, a comparison between PSI and cGPS time series could provide validation of PSI time series and allow us to determine errors from factors like baseline or atmosphere. Then we can discover the nonlinear tectonic behaviors more specifically.