

EGU24-6245, updated on 08 Dec 2024

<https://doi.org/10.5194/egusphere-egu24-6245>

EGU General Assembly 2024

© Author(s) 2024. This work is distributed under the Creative Commons Attribution 4.0 License.



Improving PSI Capabilities on Ground Deformation Monitoring for The Application of Geo-Energy Projects.

Maria Carmelia Ramlie, Paula Olea-Encina, Michele Crosetto, and Oriol Monserrat

Centre Tecnologic De Telecomunicacions De Catalunya, Geomatics, Castelldefels, Spain (mramlie@cttc.cat)

PSI Technique remains a powerful remote sensing method in terms of ground deformation monitoring, which makes it useful for monitoring geo-energy projects such as geothermal and CO₂ sequestration where movement is always detected. The monitoring is a crucial supporting component to ensure the smooth progress of geo-energy development. However, PSI Technique still faces some problems that affects the accuracy of the detection. This can be caused by data and related to the terrain of the study areas, such as vegetation, buildings, and the direction of the ground deformation. The goal is to counteract this is by combining multiple sensor images, both low resolution and high resolution. These can be obtained from the wide range of satellites available today such as Sentinel-1, TerraSAR, COSMO-SKYMED, and NISAR. This technique is supposed to increase the temporal sampling for a more comprehensive time series, redundancy to improve accuracy and robustness of PSI analysis, wider coverage by exploiting at each site the data that offers best performances. Aside from the expected improvement, some challenges in developing this technique will be presented. Most of the challenges are due to the difference in satellites' characteristics, such as resolution, pixel spacing, wavelength, and geometry. The technique is planned to be applied on several study areas. The purpose of this is to study the effects of different terrain characteristics on the re-sampling process, tuning processes, and the result of the processing. One of the study areas will serve as the benchmark of the research.