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## Cross-checking of the nationwide Ground Motion Service (GMS) of Sweden with the previous InSAR-based results: Case studies of Uppsala and Gävle Cities

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The interest for using Interferometric Synthetic Aperture Radar (InSAR) for ground motion detection and monitoring is rapidly increasing, thanks to the Copernicus Sentinel-1 satellites which cover relatively large areas with a 6-days revisit time. Ground motion of many locations, especially urban areas around the world have been studied using Sentinel-1 data and the rate and distribution of the ground movements have been reported. For Sweden, for example, Fryksten and Nilfouroushan (2019) and Gido et al. (2020) studied the active ground subsidence in Uppsala and Gävle cities using the Sentinel-1 data collected between 2015-2020. The Persistent Scatterer Interferometry (PSI) technique was used to estimate the subsidence rate and the results were validated with the help of precise levelling data and correlated with the geological observations. Today, fortunately, we have the nationwide GMS of Sweden (<https://insar.rymdstyrelsen.se>) covering almost the entire country, which provides an opportunity to compare and cross-check the results of this new service with previous studies, for example the ones reported for Uppsala and Gävle cities. The temporal coverage of satellite data used for the GMS of Sweden has an overlap with the data used in previous studies for Uppsala and Gävle cities, and the same PSI technique has been used to generate the displacement map and time series.

In this study, we used the previous PSI results of Uppsala and Gävle cities to validate the newly launched nationwide GMS of Sweden. The Line Of Sight (LOS) displacement time-series at some deforming locations were compared for both PSI-results. Although the number and imaging date of Sentinel-1 data, and the parameters used for PSI processing are not completely the same, the compared results show a good agreement between corresponding studies on the localization and rate of the subsidence in those two cities in last ~5 years. The validation phase of the new GMS of Sweden is in progress and our study shows the promising results, at least for urban areas in those two cities.

### References

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