

# Monitoring and Analysis of Ground Subsidence in Shanghai Based on PS-InSAR and SBAS-InSAR Technologies

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November 13, 2022

## Abstract

To monitor the ground sink condition of Shanghai over the past two years, monitoring data were obtained through the technical processing of 24 views from Sentinel-1A data covering Shanghai from 2019–2020 by using the PS-InSAR and SBAS-InSAR technique. The ground subsidence results were extracted via PS interferometry processing, while SRTM data were used to correct the residual phase. The subsidence rate and the accumulated amount of subsidence derived from the monitoring results revealed the urban area in Shanghai to be principally characterized by uneven ground subsidence, with multiple settlement funnels being found to be distributed across the main urban area. Moreover, when compared with the historical subsidence data, geological data, and urban construction distribution data, the individual settlement funnels were observed to correspond to those data concerning the historical surface settlement funnel in Shanghai. By randomly selecting ground subsidence time-series data regarding three feature points, it was determined that the morphological variables of the ground subsidence remained largely consistent at all time points and that their change trends exhibited a high degree of consistency, which verified the reliability of the PS-InSAR and SBAS-InSAR monitoring method. The results can provide data support for decision making in terms of geological disaster prevention and control in Shanghai.

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