

# Detection of Land Subsidence in Japan by Space-borne SAR Interferometry

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<http://vldb.gsi.go.jp/sokuchi/sar/>

Land subsidence mainly caused by excessive artificial pumping up underground water should be monitored. Leveling is a traditional way to monitor the land subsidence but it has some limitation of its labor and lack of leveling points.

Space-borne Synthetic Aperture Radar (SAR) interferometry is a powerful tool to detect surface displacement including the land subsidence. The Geographical Survey Institute had started the SAR interferometry using JERS-1 (Japanese Earth Resources Satellite -1) launched by NASDA (now JAXA) and detected a lot of displacements such as crustal deformation caused by earthquakes and volcanic activities. The GSI is planning to use the SAR interferometry as a routine land survey way to detect land changes after ALOS (Advanced Land Observing Satellite) launch by JAXA.

Now, before the ALOS launch, we have detected a lot of land subsidence in Japan using JERS-1 data and verified the accuracy of them. Because of atmospheric delay disturbance in the SAR interferometry images (interferogram) we must need careful treatment of them, such as using several interferograms to compare with each other. However, small area displacements are not likely affected by atmospheric artifacts and the SAR interferometry is found to be useful to detect land subsidence smaller than several kilometer area.