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# InSAR 時系列解析による三宅島の地殻変動
# Crustal deformation of Miyakejima by InSAR time-series analysis

小澤 拓 [1*], 上田 英樹 [1]
Taku Ozawa[1*], Hideki Ueda[1]

[1] 防災科学技術研究所
[1]NIED, Japan

To investigate volcanic deformation in detail, we developed new InSAR time-series analysis using interferograms for multiple orbit paths. For one-side looking SAR, incidence directions for ascending/descending orbits and different offnadir modes are almost included in a plane, and therefore slant-range changes for their interferograms can be expressed by two components in the common plane. This analysis estimates time-series of those components by the inversion analysis. Since this analysis has noise reduction effect by the least-square analysis, higher accuracy is obtained if many interferograms for different orbits/modes are available. Furthermore this analysis has another advantage that it can connect interferograms for different SAR sensors seamlessly. In a case study in Miyake-jima volcano, we obtained deformation time-series from PALSAR interferograms for six orbit paths, corresponding to GPS observation. Although improvement of accuracy from SBAS approach was negligible, it demonstrated an advantage that can connect interferograms for different orbit paths. Accuracy must have been improved if SAR observations have been carried out more frequently in all orbit paths. Obtained deformation shows the uplift in the west coast and the subsidence with contraction around the caldera. Although speed of uplift was almost constant, the subsidence around the caldera had decelerated from 2009. Its deformation source was estimated to horizontal source located to roughly sea level under the caldera, suggesting that subsidence was induced by the interaction between volcanic thermal activity and the aquifer. If higher accuracy is obtained from such InSAR time-series analysis, more detailed deformation change may be detected.

キーワード: SAR 干渉法, 時系列解析, 三宅島, 地殻変動, 火山
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