

Toward a detection of sporadic-E episodes by ALOS2 ScaSAR InSAR

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Maeda et al. (2016) and Furuya et al. (2017) reported their detections of sporadic-E (Es) episodes in Japan, using L-band interferometric synthetic aperture radar (InSAR). The SAR data images are acquired by Advanced Land Observation Satellite (ALOS) 1/2 launched by JAXA in 2006 and 2014, respectively. The high spatial resolution of InSAR data allow us to examine the detailed structure of Es episode, which will complement the high temporal resolution of GNSS TEC data. The previous two studies are based on stripmap-mode SAR images, which have higher spatial resolution but are limited in terms of the observation swath-width (Maeda et al., 2016; Furuya et al., 2017). Although the stripmap-mode is the most standard SAR imaging mode, ScanSAR mode is also nearly operational nowadays, and can image the Earth with much wider swath-width by as much as 350 km; the standard stripmap-mode of SM1 for ALOS2 covers only 50 km. Although the ScanSAR mode is a bit worse in terms of the spatial resolution along radar range direction than the stripmap mode image, ScanSAR InSAR image can dramatically improve the observation coverage, and thus help detect both small-scale and large-scale structure of Es. We first check the data availability of ScanSAR images in Japan at any specific areas, and then check if any significant anomalies in either TEC or ROTI are observed via the database provided by NICT. We will report our preliminary results of ScanSAR InSAR imaging of Es in Japan.

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