

## Spatial-structure of mid-latitude sporadic-E episodes revealed by L-band ALOS/PALSAR InSAR observations

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Maeda et al (2016, GRL) reported the detection of mid-latitude sporadic E event in Japan, using both GNSS TEC and L-band InSAR observations. Subsequently, Furuya et al (2017, EPS) applied split-spectrum method to the InSAR data, which allowed to virtually perform dual-frequency radar observations and to separate the signals into ionospheric dispersive and (tropospheric) non-dispersive components. Based on the small-scale non-dispersive phases that were spatially correlated with the dispersive phases, Furuya et al (2017) interpreted that the correlations might indicate the presence of nitric oxide (NO) generated by the reactions of metals, Mg and Fe, with nitric oxide ion (NO<sup>+</sup>).

The sporadic E events reported in the two reports were rather large in terms of their enhanced TEC as well as spatial scale. As such, they could be detected by Japanese nationwide GNSS network (GEONET). Meanwhile, moderate- to smaller-sized sporadic E episodes are even more difficult to detect by traditional ionosonde and GNSS/TEC observations, because the spatial scales are expected to be smaller. Here we report our detection of moderate-sized sporadic-E episodes, using Japanese L-band ALOS/PALSAR InSAR observations that enable us to examine the fine spatial structure with spatial resolutions on the order to less than 100 meters. Also, applying the split-spectrum method to the InSAR images, we have again found the presence of dispersive and non-dispersive phases that are spatially correlated with each other.

Keywords: Sporadic-E, InSAR, ALOS/PALSAR