

Evaluation of noise equivalent σ_0 for Pi-SAR-L2 and PALSAR-2.

WATANABE, Manabu^{1*}; MOTOHKA, Takeshi¹; OHKI, Masato¹; NATSUAKI, Ryo¹; YONEZAWA, Chinatsu²; SHIMADA, Masanobu¹

¹JAXA, ²Tohoku University

The noise equivalent σ_0 (NESZ) were evaluated to the data simultaneously observed with Pi-SAR-L2 and PALSAR-2 by full polarimetry mode. The observation were done on Sept. 11, 2014 over Sendai airport. Fast Fourier transforms (FFTs) was applied to the data, and 10, 20, 30, 40, 50 dB random noise were added in the frequency domain. Inverse FFTs was applied to obtain the time domain data. The change of σ_0 for the runway in the Sendai airport was examined, and the NESZ for Pi-SAR-L2 and PALSAR-2 were evaluated from the data. Estimated NESZ were -46.2, -60.5, -61.0, -55.0 dB for σ_0 HH, HV, VH, VV of Pi-SAR-L2 data, and -40.3, -50.0, -51.3, -43.0 dB of PALSAR-2 data. The NESZ for the Pi-SAR-L2 was 6 to 12 dB better than those for the PALSAR-2.

The Pi-SAR-L2 σ_0 profile for the area, where the incident angle is same, were compared with the PALSAR-2 σ_0 for each polarization. The area, where σ_0 is more than -20 dB shows almost same profile, and shows same σ_0 . On the other hand, the area, where σ_0 is less than -20 dB shows the difference. The difference was not explained by the NESZ estimated above. One of the possible causes for the higher NESZ may be higher azimuth ambiguity for the PALSAR-2 data.

Keywords: Full polarimetry,, SAR