

Phase errors due to differences in the stored radar wavelength values between ALOS-2 and ALOS-4 datasets

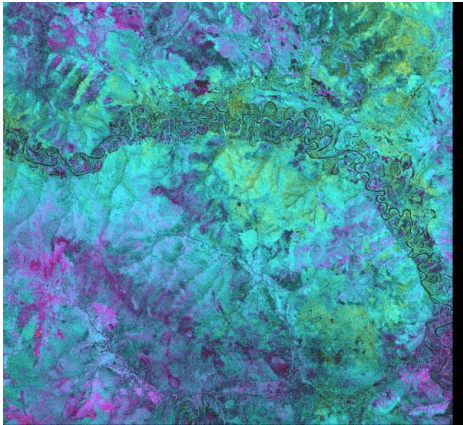
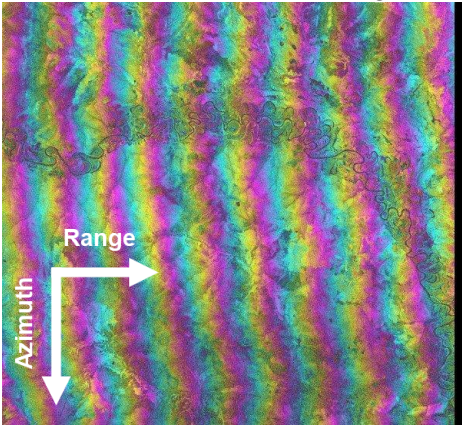


- Range-direction phase errors are observed in interferograms generated from ALOS-2 and ALOS-4 data acquired in certain observation modes when the “radar wavelength” stored in the LED file is used to calculate the radar center frequency.
- For the relevant ALOS-2 data, the “radar wavelength” stored in the LED file is rounded to five decimal places when converted to the center frequency. Using this value in the InSAR image analysis leads to a frequency difference between ALOS-2 and ALOS-4 data, resulting in the observed phase error.
- When generating interferograms between ALOS-2 (with a center frequency of 1.2365 GHz) and ALOS-4 data, the “radar wavelength” stored in the LED file of ALOS-4 (see the table below) should be used for calculating the radar center frequency instead of the value from the ALOS-2 data.

ALOS-2/-4 InSAR image (Northeastern Siberia) 2024/06/22 (ALOS-2) - 2024/09/22(ALOS-4)

Interferogram with center frequency based on ALOS-2/ALOS-4 radar wavelength

Interferogram with center frequency based on ALOS-4 radar wavelength (ionospheric delay correction applied)



Stored value of radar wavelength in the LED file (ALOS-4 Format Description 4.6-12, Data Set Summary Record No.42)

Observation mode	ALOS-2	ALOS-4
SM1	0.2384035 m	0.2384035 m
SM2	0.2424525 m	0.2424443 m
SM3	0.2424525 m	0.2424443 m
WD	0.2424525 m	0.2424443 m
SPT	0.2384035 m	0.2384035 m

※The above radar wavelength value is stored as a fixed value, regardless of the observation.

Reference:
Frequency equivalent of radar wavelength 0.2424525 m: 1.2364998 GHz
Frequency equivalent of radar wavelength 0.2424443 m: 1.2365416 GHz