Explanation of PALSAR-3 images with variable PRF and fixed PRF

Update: Dec 12, 2025

- ALOS-4 adopts the new digital beamforming SAR (Synthetic Aperture Radar) technology to expand the observation swath from ALOS-2. The ALOS-4 is planned to conduct observations with the "Variable PRF[*1]" function turned on in order to produce continuous images over a wide area. However, JAXA have confirmed that when this function is turned on, false image noise (ambiguity) is generated in some observation areas.

- JAXA has confirmed that processing improvements to mitigate ambiguities satisfy the original requirements specification. However, differences in image quality between ALOS-2 and ALOS-4 remain. Therefore, for the basic observation scenario of ALOS-4 operation using "Variable PRF" will not be implemented as of now. Instead, operation will be conducted in the "Fixed PRF" observation mode. In the "fixed PRF" observation, the above false images do not occur, although a blind area of about 10 to 20% is generated in the image.

- JAXA will continue to adjust the image quality and will issue updates as necessary.

[*1] PRF (Pulse Repetition Frequency): The number of times per second that radio waves are transmitted and received for observation. ALOS-4 employs a variable PRF system to avoid the overlap of transmission and reception caused by DBF and to obtain continuous images over a wide area.

Explanation of PALSAR-3 images with variable PRF and fixed PRF

ALOS-4

ALOS-2

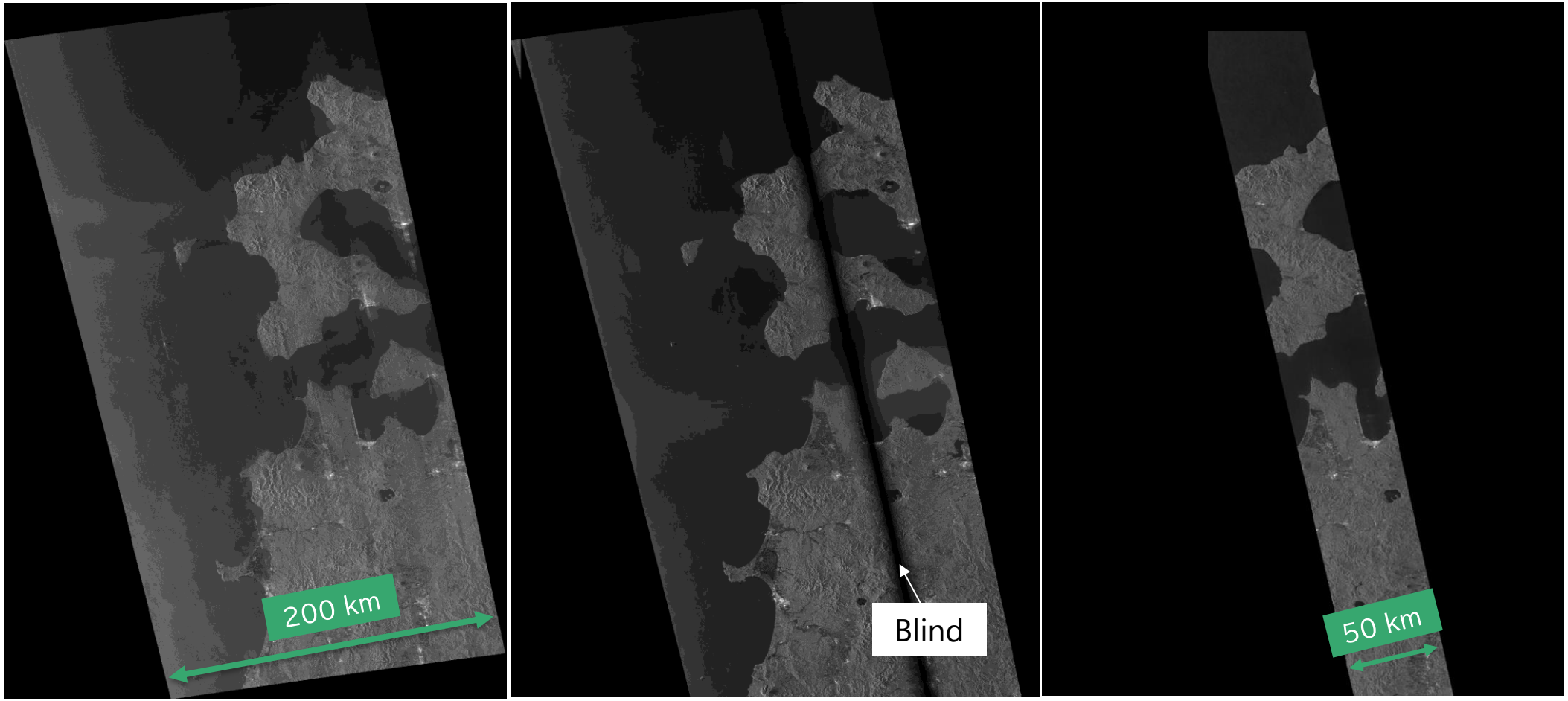
Feb. 5, 2025 (Valuable PRF)

Feb. 19, 2025 (Fixed PRF)

Stripmap 3 m
200 km swath
Japan
HH-pol.

Satellite direction (Azimuth)

Transmission (Range)



Explanation of PALSAR-3 images with variable PRF and fixed PRF

Notes on Product Use

- Standard products by fixed PRF observation can be identified by the scene ID in the file name below.

Scene_ID = ALOS41112222YYMMDDUWDPRA0106

Satellite name	Path#	Frame#	Obs. date	Mode	Right/Left, Ascending/Descending, Beam#

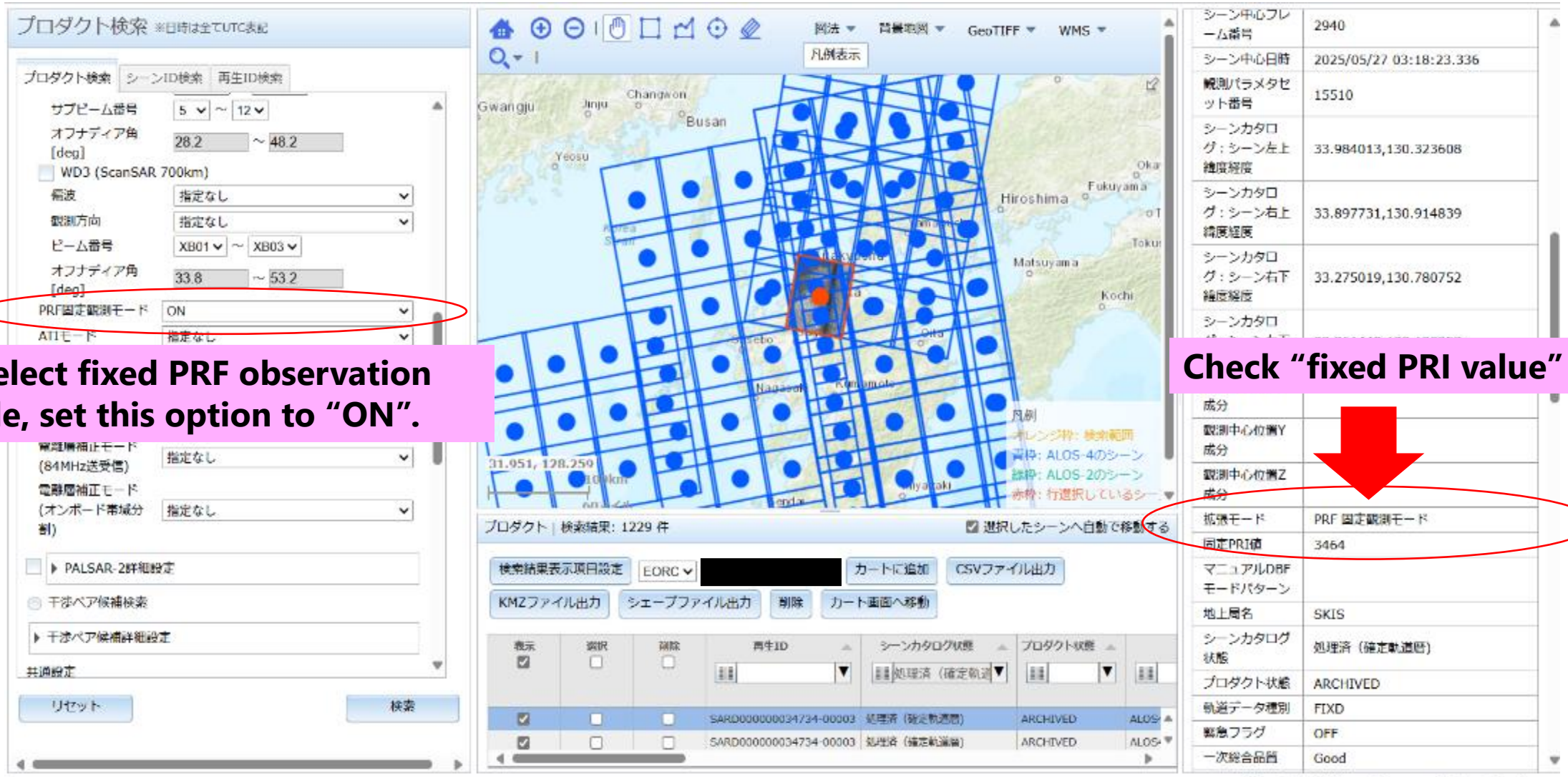
If "P", fixed PRF observation

Nominal observation is "-" (hyphen)

- To check for the presence and location of missing areas (blinds) within a scene, please follow the procedure below:
  1. Confirm the browse image displayed on the AUIG4 search screen.
  2. If no browse image is available, refer to the "PALSAR-3 PRF Fixed Observation Mode Blind Map" on the JAXA EORC ALOS website.

How to check the information on fixed PRF observation images

Display for fixed PRF observation mode-related information on the AUIG4 product search



How to check the information on fixed PRF observation images

Table of fixed PRI values v.s. observation modes

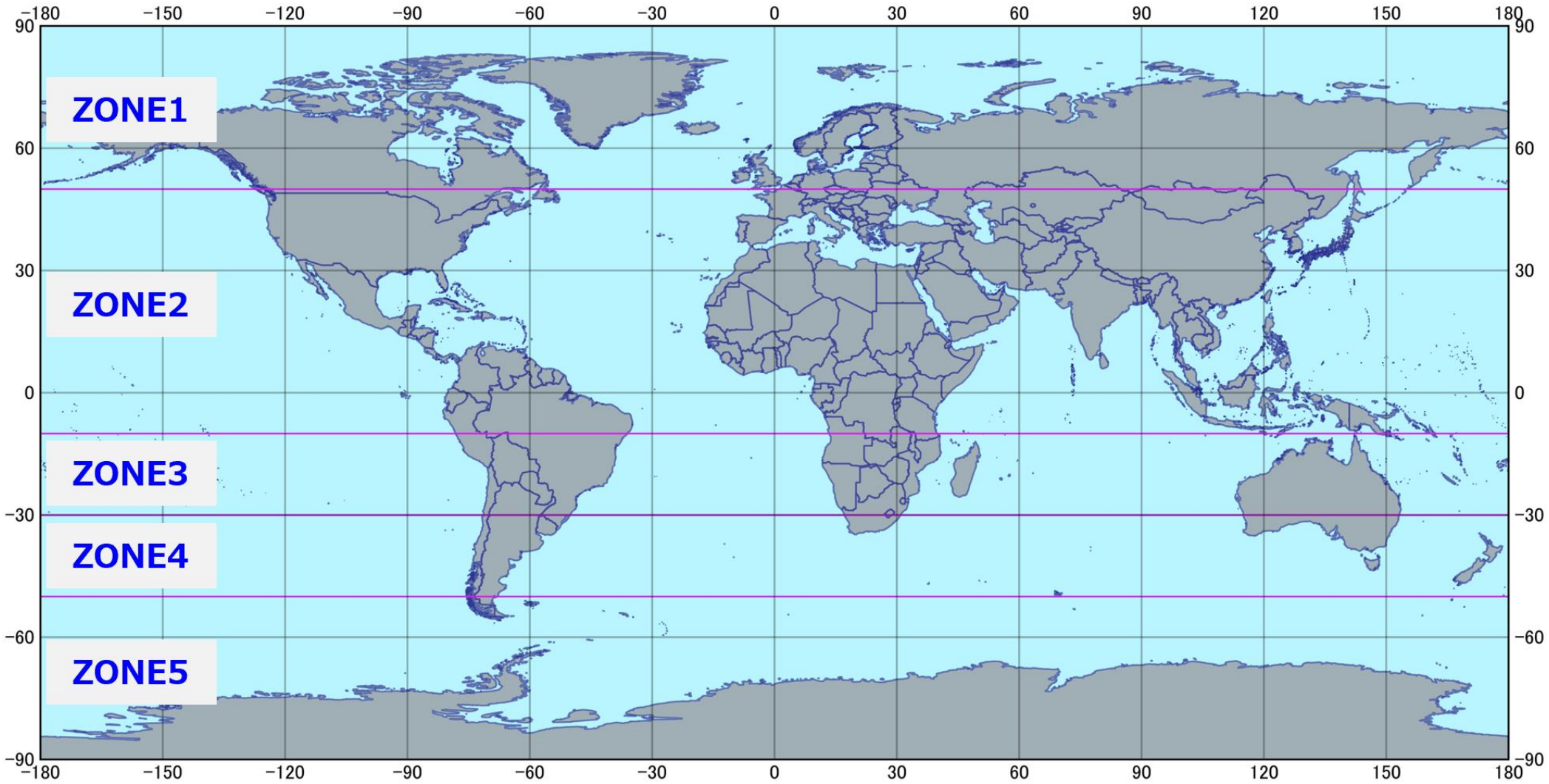
Fixed PRI values are set in two patterns for each observation mode, with different blind positions for each. Since values change based on satellite altitude, settings are divided into five global zones (see next page for zone divisions).

		Stripmap 3 m 1-2 pol.				Stripmap 3 m 4 pol.		Stripmap 6 m 4 pol.		Stripmap 10m 1-2 pol.		ScanSAR 1-2 pol.	
Zone	Altitude	SM1 200 km Pattern 1	SM1 200 km Pattern 2	SM1 100 km Pattern 1	SM1 100 km Pattern 2	SM1 FP Pattern 1	SM1 FP Pattern 2	SM2 FP Pattern 1	SM2 FP Pattern 2	SM3 200 kn Pattern 1	SM3 200 km Pattern 2	XB Pattern 1	XB Pattern 2
I	642 km	4004	3500	4004	3500	1868	1752	2804	2548	5608	4672	3500	3112
II	635 km	3960	3464	3960	3464	1848	1732	2772	2520	5548	4620	3464	3080
III	640 km	3992	3492	3992	3492	1864	1744	2792	2540	5592	4656	3492	3104
IV	647 km	4032	3528	4032	3528	1884	1764	2824	2568	5652	4708	3528	3136
V	655 km	4084	3572	4084	3572	1904	1788	2860	2600	5720	4764	3572	3176

※ Spotlight mode always operates at a fixed PRF and does not have this setting.
※ Observation modes and beams not listed in the table above are omitted because they are not intended for use in basic observation scenarios or emergency observations for disasters.
※ Some observations may be conducted using settings different from those listed above.

How to check the information on fixed PRF observation images

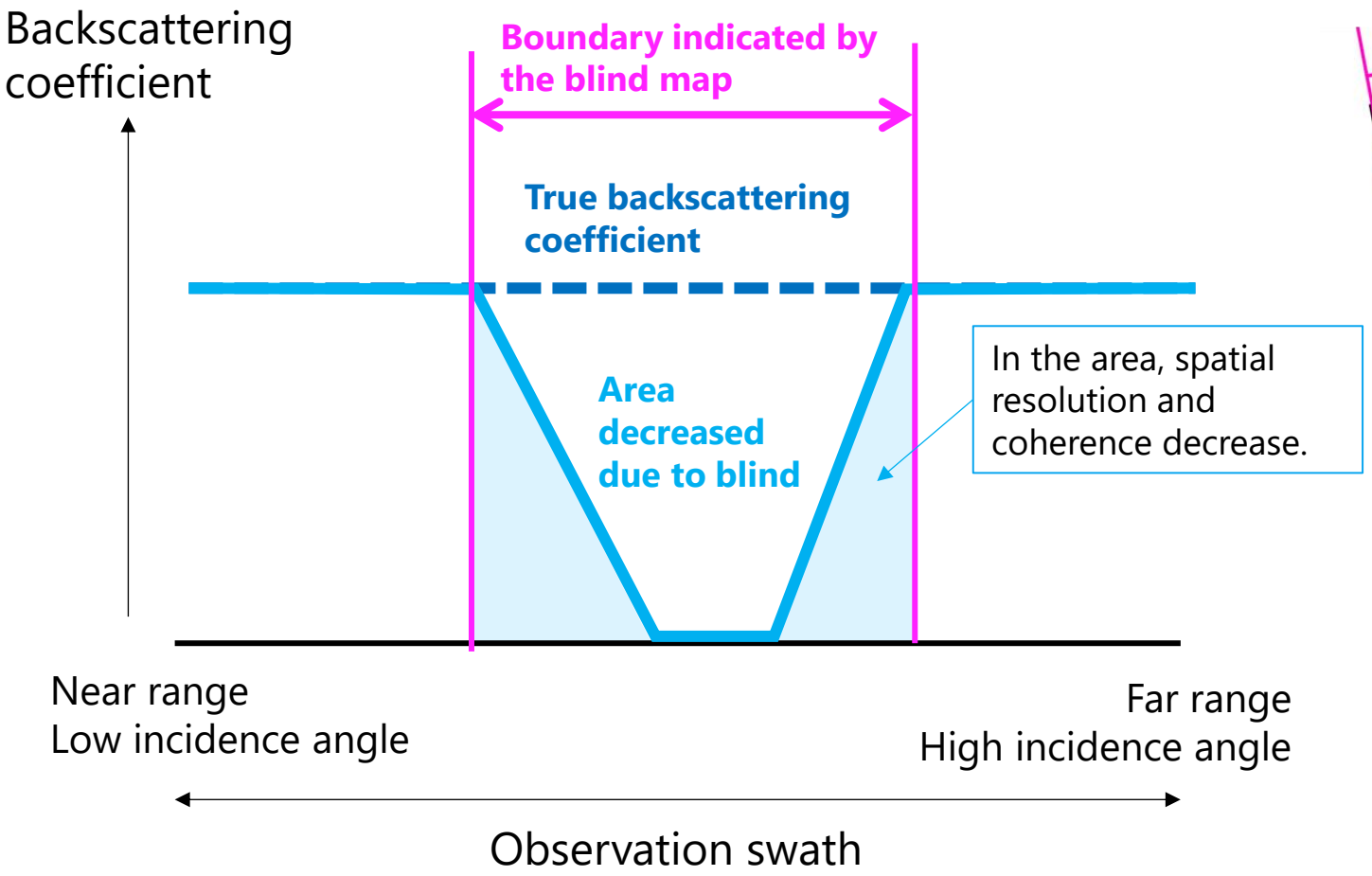
Zone definition based on satellite altitude



How to check the information on fixed PRF observation images

Profile of backscattering coefficient (i.e., image intensity)

Example when the backscattering coefficient is constant



Blind map for Stripmap 3 m/ 200 km swath

Left：fixed PRF pattern 1、Right：fixed PRF pattern 2