

ALOS-2/PALSAR-2 Calibration and Validation Results

Ver. 2025.10

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Summary of evaluation results of ALOS-2 PALSAR-2 standard products [1/3]

✓ Observation dates of the evaluated scenes: July, 2014 ~ September, 2025

Items		Observation modes	Results	Number of data	Requirements
Geometric accuracy [m]		Stripmap and Spotlight	5.78 m (L1.1) 6.73 m (L2.1)	639 129	≤ 20 m
		ScanSAR	60.77 m (L1.1) 29.33 m (L2.1)	7 8	≤ 100 m
Radiometric accuracy [dB]	Evaluation using corner reflectors	Stripmap and Spotlight	0.547 dB (1σ) (mean CF: -83.005 dB)	394	≤ 1.0 dB
	Evaluation using images over Amazonian forests	Stripmap and Spotlight	0.41 dB (1σ) (mean γ^0 : -7.50 dB)	30 scenes	
Polarimetry	VV/HH amplitude ratio	Stripmap 6m (polarimetry)	1.006 ($\sigma=0.014$)	61	$\leq 1 \pm 0.047$
	VV/HH phase difference [deg.]		-0.509 deg ($\sigma=1.383$)		≤ 5 deg
	Cross talk [dB]		-43.479 dB ($\sigma=6.605$) [HV/HH] -43.376 dB ($\sigma=5.597$) [VH/VV]		≤ -30 dB

The updated items are shown in red letters.

Summary of evaluation results of ALOS-2 PALSAR-2 standard products [2/3]

Items		Observation modes	Results	Number of data	Requirements
Resolution [m]		Spotlight	Az. 0.95 ($\sigma=0.32$) Rg. 1.69 ($\sigma=0.01$)	8	Az. 1.00 x 1.1 Rg. 1.78
		Stripmap 3m	Az. 2.81 ($\sigma=0.03$) Rg. 1.71 ($\sigma=0.02$)	238	Az. 2.75 x 1.1 Rg. 1.78
		Stripmap 6m	Az. 4.01 ($\sigma=0.03$) Rg. 3.51 ($\sigma=0.02$)	115	Az. 3.75 x 1.1 Rg. 3.57
		Stripmap 10m	Az. 4.96 ($\sigma=0.05$) Rg. 5.32 ($\sigma=0.05$)	74	Az. 5.00 x 1.1 Rg. 5.36
Sidelobe (dB)	PSLR	All	Az. -16.356 ($\sigma=2.121$) Rg. -12.727 ($\sigma=0.535$)	435	$\leq -13.26 + 2.00$ dB
	ISLR	All	-9.171 ($\sigma=1.455$)		$\leq -10.16 + 2.00$ dB

The updated items are shown in red letters.

Summary of evaluation results of ALOS-2 PALSAR-2 standard products [3/3]

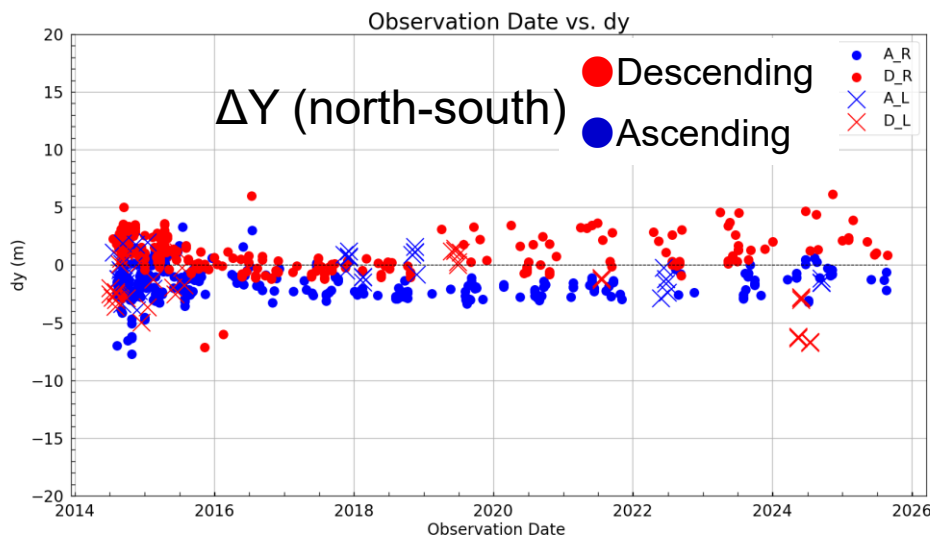
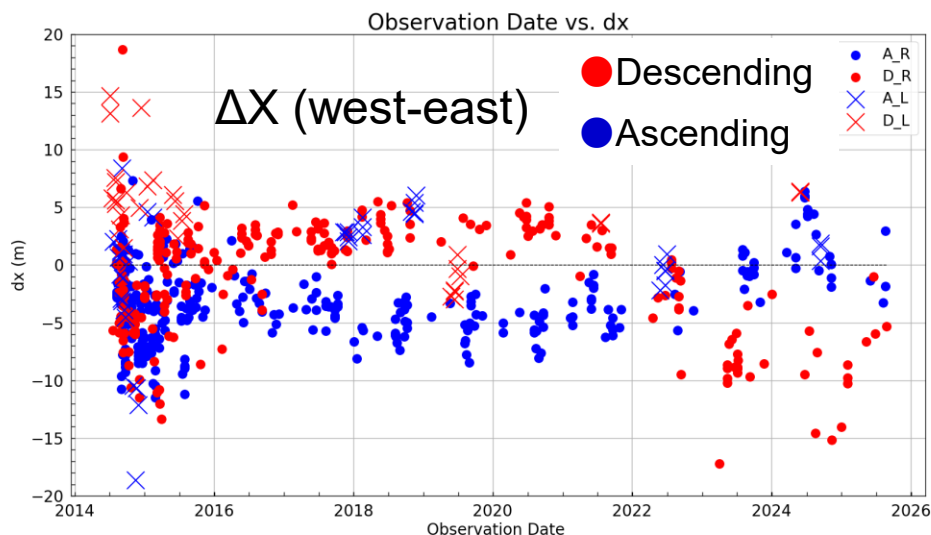
Items		Observation modes	Results	Number of data	Requirements
NESZ [dB]		Stripmap 3m (U2)	-36.6 (HH)	3	≤ -24.0 dB (scene center)
		Stripmap 6m (FP6-3~7)	-36.0 (HH) -46.0 (HV)	5	≤ -28.0 dB (scene center)
		Stripmap 10m (F2)	-41.1 (HH) -49.2 (HV)	3	≤ -26.0 dB (scene center)
Ambiguity [dB]	Azimuth	All	14-23 dB (ave. 20dB)	7 scenes	$\geq 20-25$ dB
	Range	All	Not visible	7 scenes	$\geq 20-25$ dB

Evaluation results of geometric accuracy

Differences between point target responses in SAR images and in situ GPS measurements

Mode	ΔX (west-east) [m]			ΔY (north-south) [m]			n
	mean (bias)	SD	RMS	mean (bias)	SD	RMS	
Spotlight	-6.099	5.692	8.543	-0.403	1.825	1.873	12
Stripmap 3 m (U2-6~9, U3-10~14)	-0.765	5.474	5.527	0.021	2.163	2.163	335
Stripmap 6 m (FP6-3~7)	-2.494	3.836	4.579	-1.438	1.333	1.963	175
Stripmap 10 m (F2-5~7)	-3.233	4.675	5.692	-0.761	2.209	2.338	117

The updated items are shown in red letters.



The result of the geometric accuracy evaluation of Stripmap 3 m, 6m, 10m, and Spotlight 1m from 2014.

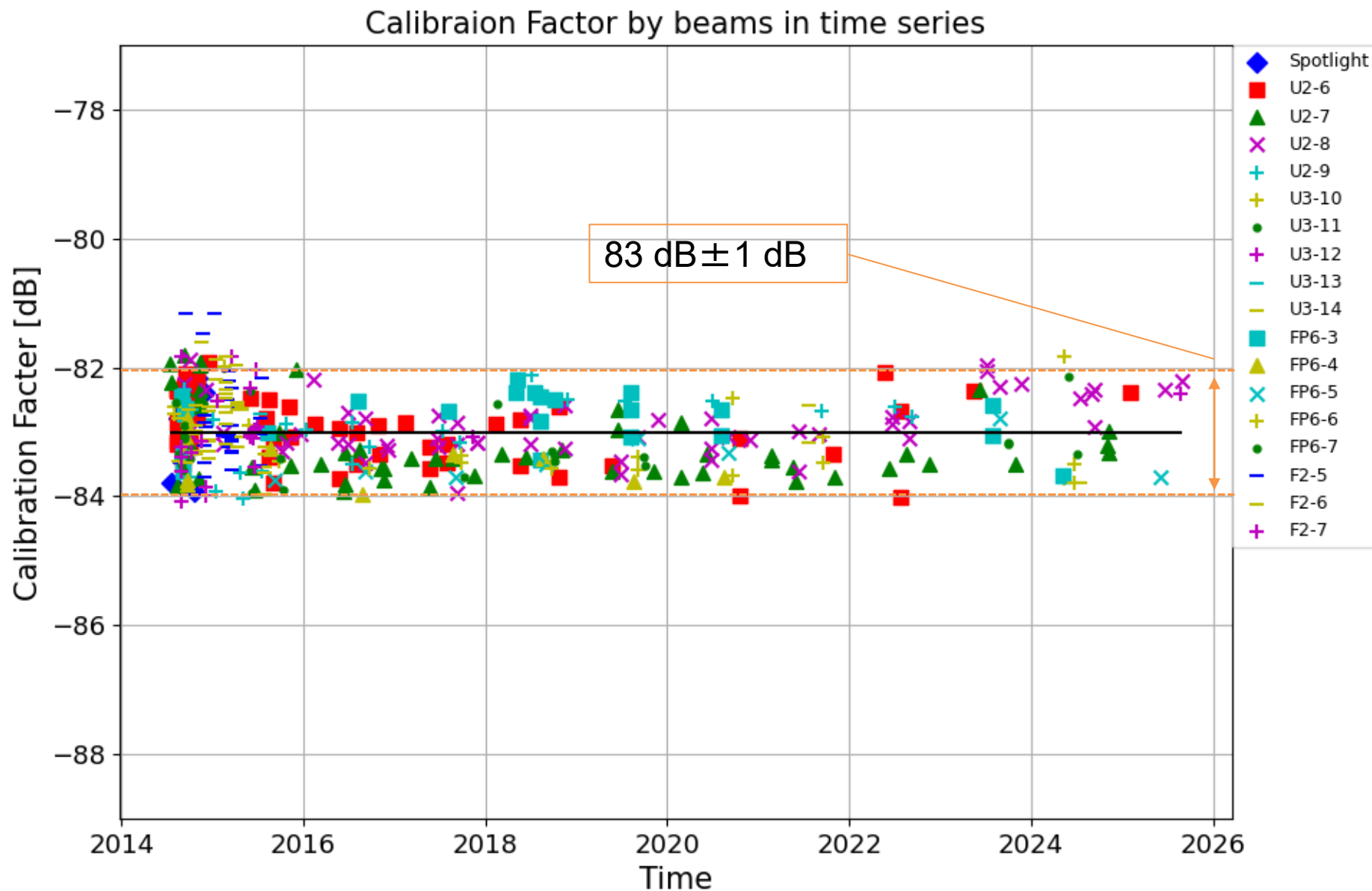
Note: Especially since 2021, geometric accuracy is affected by the ionosphere. For more information, please refer to https://www.eorc.jaxa.jp/ALOS/en/alos-2/pdf/ALOS2_calval_ionospheric_error_202207_En.pdf

Evaluation results of radiometric accuracy – calibration factor (CR) [1/2]

Mode	Mean [dB]	SD [dB]	RMS to -83 dB [dB]	n
Spotlight	-82.831	0.657	0.682	8
U2-6	-82.972	0.486	0.487	57
U2-7	-83.229	0.569	0.614	52
U2-8	-82.926	0.435	0.442	56
U2-9	-82.986	0.496	0.496	28
FP6-3	-82.795	0.416	0.466	23
FP6-4	-83.419	0.381	0.580	12
FP6-5	-83.420	0.323	0.550	9
FP6-6	-83.323	0.393	0.516	16
FP6-7	-83.267	0.351	0.445	22
F2-5	-82.806	0.659	0.687	31
F2-6	-82.838	0.526	0.551	44
F2-7	-83.172	0.583	0.609	17
ALL	-83.025	0.530	0.531	375

The updated items are shown in red letters.

Evaluation results of radiometric accuracy – calibration factor (CR) [2/2]



Evaluation results of polarimetric accuracy

