Calibration Result of JAXA standard products (As of July 1, 2009)

PRISM Level 1B2 data products

- Geometric calibration accuracy: Observation date from Jun. 22, 2007 to Jun. 4, 2009

    1. 1) Absolute accuracy

	Pixel direction (cross track)	Line direction (along track)	Distance	No of GCPs	No of Scenes
Nadir view (RMS)	5.6 m	5.3 m	7.8 m	5,499	586
Forward view (RMS)	4.9 m	6.1 m	7.8 m	1,771	225
Backward view (RMS)	5.0 m	7.1 m	8.7 m	4,839	525

        – Measurements: Statistical evaluation of the worldwide ground control points (GCPs) and calculation of the root mean square (RMS) of the distance between the position of GCPs, that were identified in the each PRISM image and obtained from the coordination conversion formula, and their true location on the GRS 80 that were calculated from the GCPs true measurement by GPS and the PRISM observation geometry.

        – For reference: CE90
        Nadir view: 11.8 m, Forward view: 12.4 m, Backward view: 13.4 m

    2. 2) Relative accuracy (three radiometers)

	Pixel direction	Line direction	Distance
Std. dev. in a scene(1 σ)	1.4 m	1.8 m	2.4 m

        – Measurements: Averaged value of standard deviation of geometric errors in a scene in evaluating absolute accuracy.

- – Radiometric calibration accuracy

1. 1) Absolute accuracy (Nadir-looking radiometer)

    Similar to that of AVNIR-2 (better than 3%, RMS)
    - Measurements: Compared with calibrated AVNIR-2 as cross
    calibration over deserts, salt lakes, ocean etc.

2. 2) Relative Accuracy (three radiometers)

    Better than 0.4 % (better than 1DN) (RMS)

Reference: T. Tadono, M. Shimada, H. Murakami, and J. Takaku, "Calibration of PRISM and AVNIR-2 Onboard ALOS "Daichi"," IEEE Trans. Geoscience and Remote Sensing, Vol. 47, No. 12, pp.4042-4050, Dec. 2009.

AVNIR-2 Level 1B2 data products

- Geometric calibration accuracy
    1. 1) Absolute Accuracy

	Pixel direction (cross track)	Line direction (along track)	Distance
0 deg. pointing angle (RMS)	71.1 m	7.5 m	71.9 m
+/-41.5deg. pointing angles (RMS)	60.9 m	96.6 m	114.2 m

    - Measurements: Statistical evaluation of the worldwide GCPs in total
    1,035 points in 54 scenes and calculation of the RMS of the distance
    between the position of GCPs, that were identified in the each
    AVNIR-2 image and obtained from the coordination conversion formula,
    and their true location on the GRS 80 that were calculated from the

GCPs true measurement by GPS and the AVNIR-2 observation geometry.

2. 2) Relative Accuracy

	Pixel direction	Line direction	Distance
Std. dev. in a scene(1 σ)	3.4 m	7.7 m	8.5 m

- Measurements: Averaged value of standard deviation of geometric errors in a scene in evaluating absolute accuracy.

- - Radiometric calibration accuracy
  1. 1) Absolute accuracy

Band 1 to 3:	3% (RMS)
Band 4:	7% (RMS)

- Measurements: Compared with calibrated MODIS instruments onboard TERRA and AQUA satellites as cross calibration over deserts, salt lakes, snow and ice fields, ocean etc.

2. 2) Relative Accuracy (three radiometers)

Better than 0.4 % (better than 1DN) (RMS)

References: T. Tadono, M. Shimada, H. Murakami, and J. Takaku, "Calibration of PRISM and AVNIR-2 Onboard ALOS "Daichi"," IEEE Trans. Geoscience and Remote Sensing, Vol. 47, No. 12, pp.4042-4050, Dec. 2009.
H. Murakami, T. Tadono, H. Imai, J. Nieke, and M. Shimada, "Improvement of AVNIR-2 Radiometric Calibration by Comparison of Cross-Calibration and Onboard Lamp Calibration," IEEE Trans. Geoscience and Remote Sensing, Vol. 47, No. 12, pp.4051-4059, Dec. 2009.

PALSAR level1.1/1.5Product

- Radiometric calibration accuracy (common for all the off-nadir angles)

Absolute accuracy		0.76dB(1 σ) : Corner reflector
		0.22dB(1 σ): Amazon Forest *
Noise equivalent sigma-naught		-34dB (FBD-HV)
		-32dB (FBD-HH)
		-29dB (FBS-HH)
Amplitude ratio of VV/HH for PLR		1.013(0.062:1 σ)
Phase difference of VV and HH for PLR		0.612deg(2.66deg:1 σ)
Cross talk (PLR)		31.7dB
Resolution	Single look in azimuth	4.49 m
	Range	9.6m (FBD, PLR, DSN)
	Range	4.8m (FBS)
Sidelobes	In azimuth	-16.6dB
	In range	-12.6dB
	Two-dimensional	-8.6dB

-Measurement: Statistical analysis of the impulse response of the corner reflector at the calibration site and the responses from the Amazon rainforest.
* Standard deviation of the incidence angle dependence of the gamma-naught** measured for five off-nadirs (e.g., 9.9, 21.5, 34.3, 41.5, and 50.8 degrees).
** Gamma-naught: normalized radar cross section (NRCS or sigma-naught) divided by the cosine of Incidence angel

- Ambiguity

Range	23dB
Azimuth	Un-measurable

- Geometric accuracy (common for all the incidence angles)

9.7 m (RMS)	FBS, FBD, PLR, DSN
70 m (RMS)	WB1, WB2

-Measurements: Statistical evaluation of the worldwide CRs in total 572 and calculation of the root sum square of the distance between the position of the Corner reflector, that is identified in the PALSAR image and obtained from the PALSAR geometric conversion formula, and its true location on the GRS80 that is calculated from the CR true measurement and the SAR observation geometry.

Reference: M. Shimada, O. Isoguchi, T. Tadono, and K. Isono, "PALSAR Radiometric and Geometric Calibration," IEEE Trans. Geoscience and Remote Sensing, Vol. 47, No. 12, pp.3915-3932, Dec. 2009.