Quasi-Zenith Satellite System
Service Performance Report
MADOCA-PPP
Technology Demonstration (Ionospheric Correction)
(Before Service Launch, 1stH 2025)

December 2025

Cabinet Office

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1. Outline

As a technical demonstration, wide-area ionospheric correction information for the Asia and Oceania regions will be additionally transmitted via L6D messages of QZS-6 and QZS-7 to shorten the initial convergence time of MADOCA-PPP(*1). Broadcast from QZS-6 via L6D began in July 2025, and transmission from QZS-7 is planned after its service launch. This document describes the evaluation results of performance improvements using ionospheric correction information.

(*1) Service Level Information for MADOCA-PPP Technology Demonstration (Ionospheric Correction) is available at the following web address.:
https://qzss.go.jp/en/technical/ps-is-qzss/sli_mdc_ion_agree.html (English)
https://qzss.go.jp/technical/download/sli_mdc_ion_agree.html (Japanese)

2. Service Performance Evaluation Conditions

2.1. Evaluation Period

From April 1, 2025 to September 30, 2025 (UTC)

2.2. Evaluation Item

The following performance improvements with ionospheric correction are evaluated comparing to the case without ionospheric correction.

- Convergence Time
- Positioning Accuracy after convergence

2.3. Evaluation Points

Evaluation points in the Asia and Oceania regions are shown in Table 2.3-1. Evaluation points in Japan region are shown in Table 2.3-2. The entire service area of ionospheric correction is shown in Figure 2.3-1. Figures 2.3-2 to 2.3-5 show the service areas and evaluation points for Australia, the Philippines, Indonesia, and Japan, respectively.

Table 2.3-1 Evaluation points in the Asia and Oceania

#	Station Name	Latitude [deg]	Longitude [deg]	Area
1.1	KAT100AUS	-14.3760	132.1533	R002-A01
1.2	TOW200AUS	-19.2693	147.0557	R002-A02
1.3	BULA00AUS	-22.9135	139.9031	R002-A11
1.4	MCHL00AUS	-26.3589	148.1449	R002-A12
1.5	TBOB00AUS	-29.4502	142.0574	R002-A13
1.6	CBLT00AUS	-27.0844	152.9515	R002-A14
1.7	MOBS00AUS	-37.8294	144.9753	R002-A15
1.8	HOB200AUS	-42.8047	147.4387	R002-A16
1.9	CEDU00AUS	-31.8666	133.8098	R001-A05
1.10	NNOR00AUS	-31.0487	116.1927	R001-A06
1.11	ALIC00AUS	-23.6701	133.8855	R002-A07
1.12	WLAL00AUS	-19.7786	120.6435	R001-A08
2.1	PCDN00PHL	*2	*2	R003-A01
2.2	PTGG00PHL	14.5354	121.0413	R003-A02
2.3	PCEB00PHL	*2	*2	R003-A03*3
2.4	PDUM00PHL*1	*2	*2	R003-A04*3
2.5	PNDO00PHL*1	*2	*2	R003-A05*3
3.1	CIBG00IDN	-6.490	106.849	R004-A01

*1: Since these stations can only receive GPS and GLONASS satellites, the data is provided for reference purposes only.

*2: Data of these evaluation points are provided based on the intergovernmental cooperation and their locations are not disclosed in this document.

*3: In July 2025, R003-A03, A04, A05 were newly added.

Table 2.3-2 Evaluation points in Japan

#	Station Name	Latitude [deg]	Longitude [deg]	Area
4.1	0787 KAMIFURANO	43.4316	142.6430	R005-A01
4.2	0556 MURAYAMA	38.4967	140.3651	R005-A02
4.3	0223 CHICHIBU	35.9868	139.0756	R005-A03
4.4	0602 AOGASHIMA	32.4635	139.7646	R005-A03
4.5	0345 SANNAN	35.0907	134.9725	R005-A04
4.6	0696 FUKAE	32.7225	130.3522	R005-A05
4.7	0735 WADOMARI	27.4012	128.6507	R005-A06
4.8	0497 MINAMIDAITO	25.8312	131.2278	R005-A06
4.9	0749 ISHIGAKI1	24.5366	124.3012	R005-A07
4.10	2007 CHICHIJIMA-A	27.0675	142.1950	R005-A08

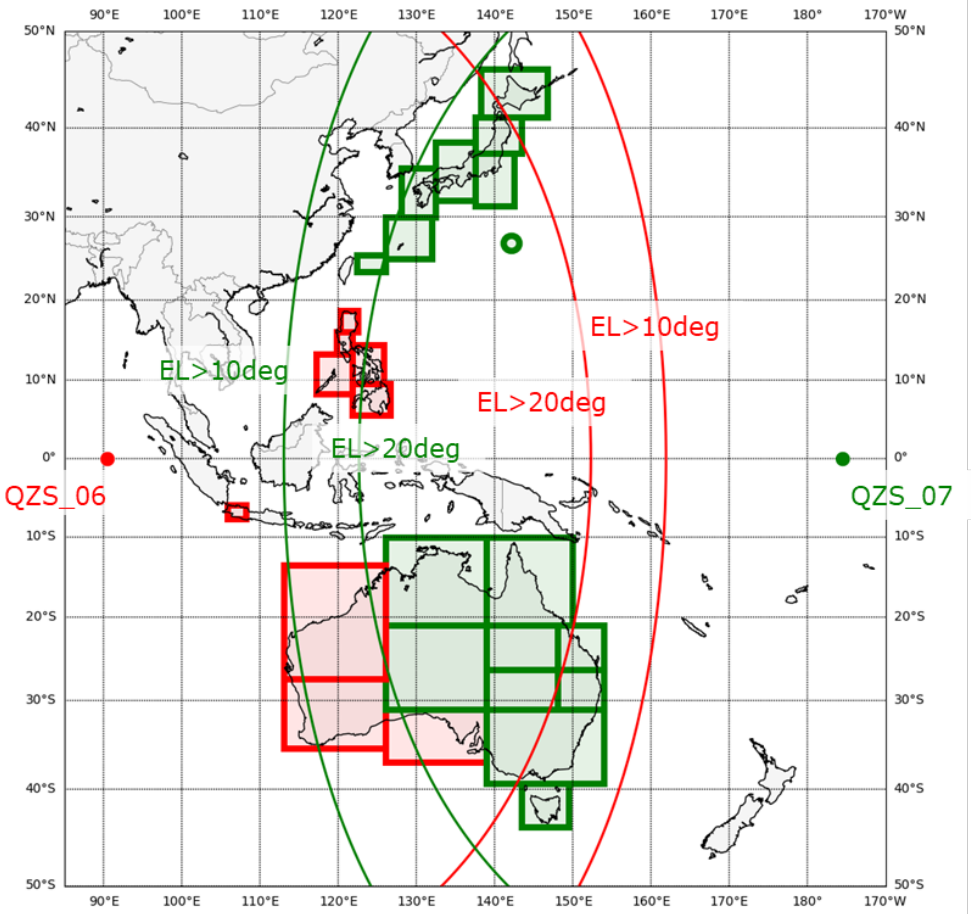

Figure 2.3-1 Service area of technology demonstration (Ionospheric Correction)

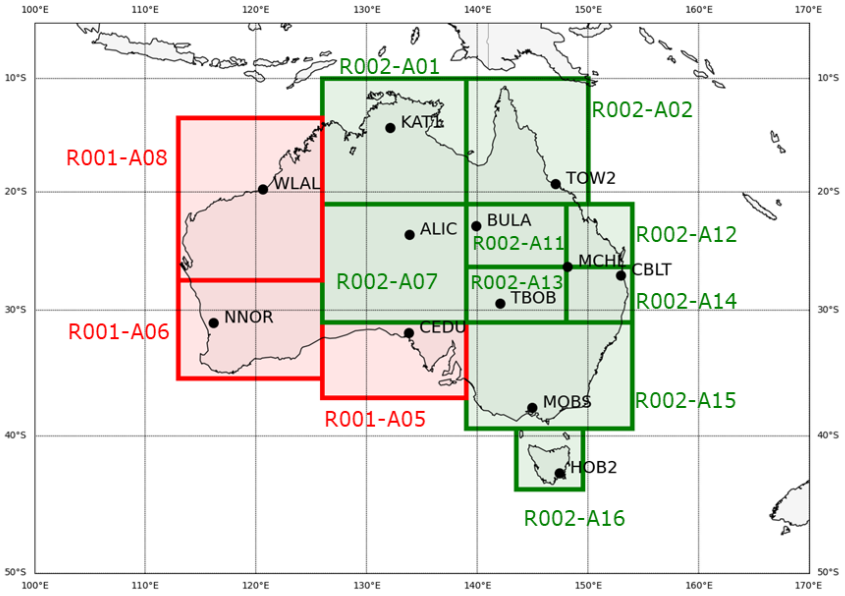

Figure 2.3-2 Service areas and evaluation points in Australia

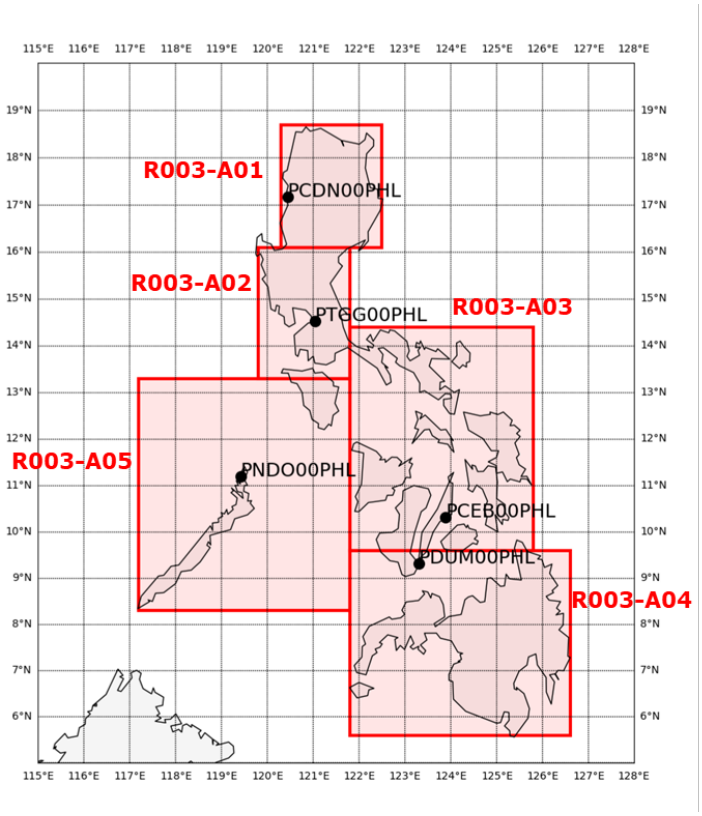

Figure 2.3-3 Service areas and evaluation points in the Philippines

Figure 2.3-4 Service areas and evaluation points in Indonesia

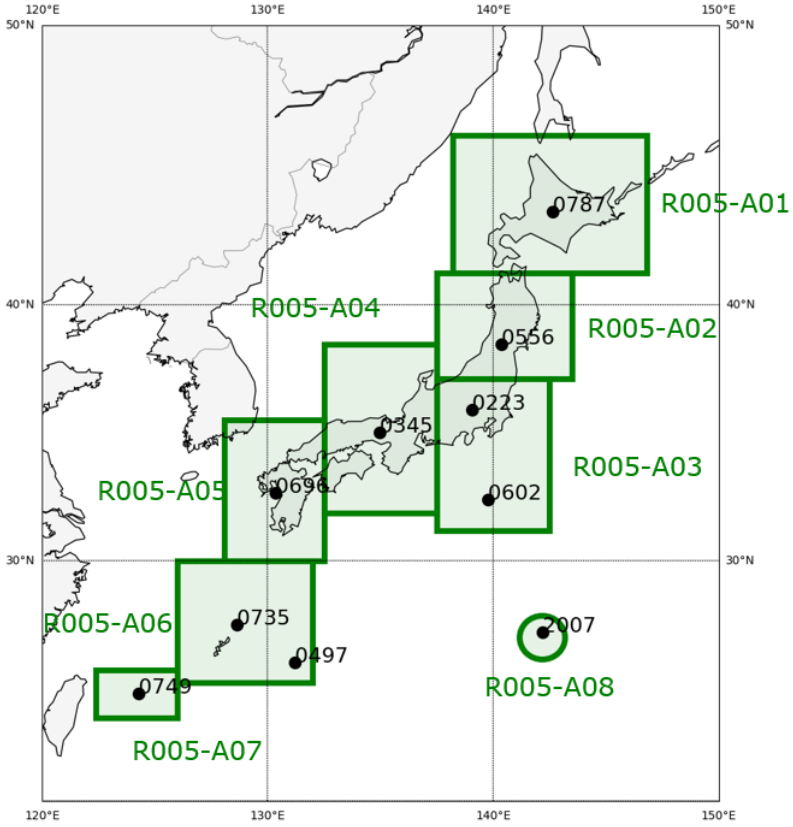

Figure 2.3-5 Service areas and evaluation points in Japan

2.4. Augmented GNSS

- GPS+QZSS+Galileo+GLONASS

2.5. Calculation Conditions

2.5.1. Evaluation Conditions

- PPP Conditions

  See Table 2.5-1.

Table 2.5-1 PPP Conditions

No.	Item	Without wide-area ionospheric correction	With wide-area ionospheric correction	Notes
1	Positioning method	PPP Kinematic	PPP Kinematic	
2	Observation Data Frequency	GPS(L1, L2) QZSS(L1, L5) Galileo (E1, E5a) GLONASS(L1, L2)	GPS(L1, L2) QZSS(L1, L5) Galileo (E1, E5a) GLONASS(L1, L2)	
3	Ionospheric correction method	Estimate ionospheric delay for each satellite	Estimate ionospheric delay for each satellite and constrain with wide-area ionospheric information	
4	Tropospheric correction method	Estimate zenith tropospheric delay	Estimate zenith tropospheric delay	
5	Ambiguity resolution	Apply	Apply	
6	Elevation mask	10 deg	10 deg	

- Tool and Data

  The MADOCA-PPP test library (MADOCALIB; Multi-GNSS Advanced Orbit and Clock Augmentation - Precise Point Positioning Test Library), and the archived L6 messages are utilized (*1).

  - MADOCALIB: Ver. 1.4 (1 April 2025 -30 June 2025)
    Ver. 2.0 (1 July 2025 -)
  - Key parameter setting: See Table 2.5-2 and Table 2.5-3 (These and other parameters are same as the sample configuration files in the library.)

Table 2.5-2 Parameter Settings With and Without Ionospheric Correction (Ver.1.4)

Item	PPP-AR without ionospheric correction (sample_pppar.conf)	PPP-AR with ionospheric correction (sample_pppar_iono.conf)	Notes
pos1-posmode	ppp-kine	ppp-kine	
pos1-frequency	l1+2	l1+2	
pos1-soltype	forward	forward	
pos1-elmask	10	10	
pos1-tidecorr	on	on	
pos1-ionoopt	est-stec	est-stec	
pos1-tropopt	est-ztd	est-ztd	
pos1-sateph	brdc+ssrapc	brdc+ssrapc	
pos1-navsys	29	29	
pos2-ionocorr	off	on	
pos2-armode	continuous	continuous	
pos2-arsys	25	25	
pos2-arthres	2.5	2.5	
pos2-arelmask	15	15	
pos2-slipthres	0.15	0.15	
pos2-rejionno	100	100	
pos2-rejgdop	30	30	
pos2-siggpsIIR-M	0	0	
pos2-siggpsIIF	0	0	
pos2-siggpsIIIA	0	0	
pos2-sigqzs1_2	0	0	
stats-eratio1	300	300	
stats-eratio2	300	300	
stats-uraratio	0.1	0.1	
stats-errphase	0.003	0.003	
stats-errphaseel	0.003	0.003	
file-satantfile	igs20.atx(*2)	igs20.atx(*2)	
file-rcvantfile	igs20.atx(*2)	igs20.atx(*2)	

Table 2.5-3 Parameter Settings With and Without Ionospheric Correction (Ver.2.0)

Item	PPP-AR without ionospheric correction (sample_pppar.conf)	PPP-AR with ionospheric correction (sample_pppar_iono.conf)	Notes
pos1-posmode	ppp-kine	ppp-kine	
pos1-frequency	l1+2(*3)	l1+2(*3)	
pos1-soltype	forward	forward	
pos1-elmask	10	10	
pos1-tidecorr	on	on	
pos1-ionoopt	est-stec	est-stec	
pos1-tropopt	est-ztd	est-ztd	
pos1-sateph	brdc+ssrapc	brdc+ssrapc	
pos1-navsys	29(*4)	29(*4)	
pos2-ionocorr	off	on	
pos2-armode	continuous	continuous	
pos2-arsys	57(*4)	57(*4)	
pos2-arthres	2.5	2.5	
pos2-arelmask	15	15	
pos2-slipthres	0.15	0.15	
pos2-rejionno	100	100	
pos2-rejgdop	30	30	
pos2- siggps	L1/L2/L5(*3)	L1/L2/L5(*3)	
pos2- sigqzs	L1/L5/L2(*3)	L1/L5/L2(*3)	
pos2- siggal	E1/E5a/E5b/E6(*3)	E1/E5a/E5b/E6(*3)	
pos2- sigbds2	B1I/B3I/B2I(*3,*4)	B1I/B3I/B2I(*3,*4)	
pos2- sigbds3	B1I/B3I/B2a(*3,*4)	B1I/B3I/B2a(*3,*4)	
stats-eratio1	300	300	
stats-eratio2	300	300	
stats-uraratio	0.1	0.1	
stats-errphase	0.003	0.003	
stats-errphaseel	0.003	0.003	
file-satantfile	igs20.atx(*2)	igs20.atx(*2)	
file-rcvantfile	igs20.atx(*2)	igs20.atx(*2)	

(*1) MADOCALIB is available at the following web address:
https://qzss.go.jp/en/technical/dod/madoca/madoca_test-library.html (English)
https://qzss.go.jp/technical/dod/madoca/madoca_test-library.html (Japanese)

Archives are available at the following web address:
https://sys.qzss.go.jp/dod/en/archives/agree_madoca.html

(*2) The antenna phase information file was obtained on the IGS Web site.
https://cddis.nasa.gov/Data_and_Derived_Products/GNSS/GNSS_product_holdings.html

(*3) Since pos1-frequency takes precedence over the settings for pos2-siggps, pos2-sigqzs, pos2-siggal, pos2-sigbds2, and pos2-sigbds3, this configuration is equivalent to dual-frequency.

(*4) pos1-navsys=29 specifies GPS, QZSS, Galileo, and GLONASS. Although pos2-arsys is set to 57, the pos1-navsys setting takes precedence. As a result of this configuration, the settings for pos2-sigbds2 and pos2-sigbds3 are ignored.

2.5.2. Initial Convergence Time

- The PPP calculation was performed every 15 minutes during the evaluation period.
- By using each calculation result, the positioning accuracy (95%) was statistically calculated every 30 seconds.
- Initial convergence time was calculated as the time for the positioning accuracy (95%) to reach below 30 cm horizontally and 50 cm vertically from the start of PPP calculation.

2.5.3. Positioning Accuracy after Convergence

- The PPP calculation started at 00:00:00 every day.
- By using each calculation result, the positioning accuracy (95%) was statistically calculated every 30 seconds.
- Positioning Accuracy after convergence was the horizontal and vertical positioning accuracy (95%) from 00:30:00 to 23:59:30 every day.

3. Evaluation Results

3.1. Initial Convergence Time

See Figure 3.1-1, 3.1-2, Table 3.1-1 and Table 3.1-2.

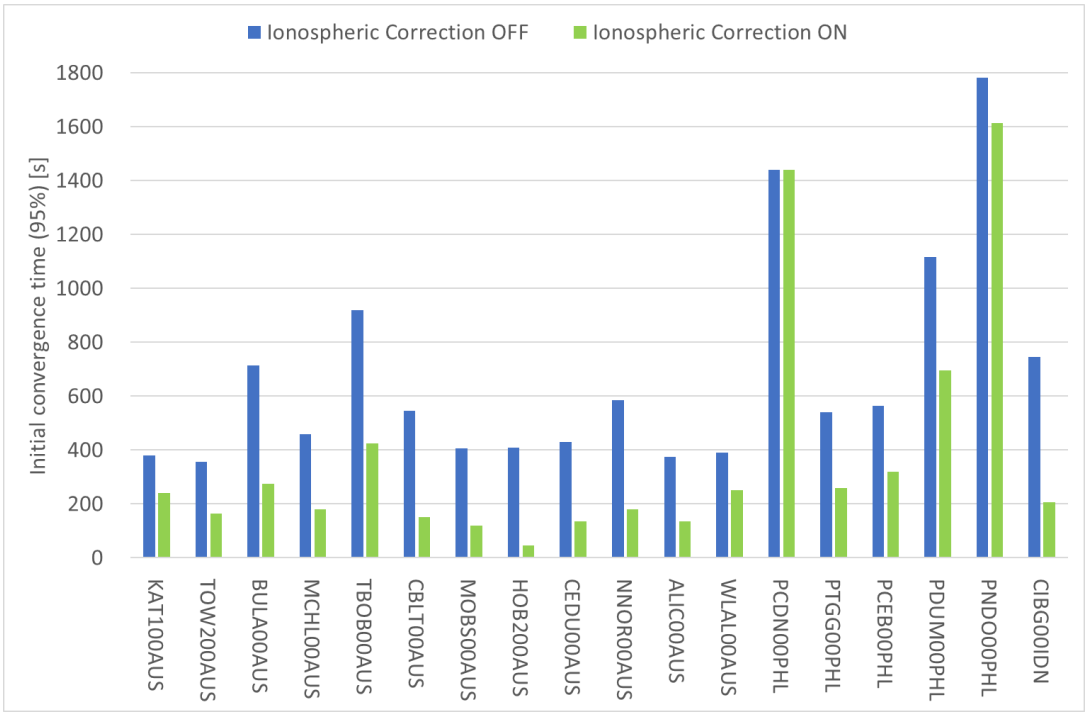

Figure 3.1-1 Initial Convergence Time (Asia and Oceania)

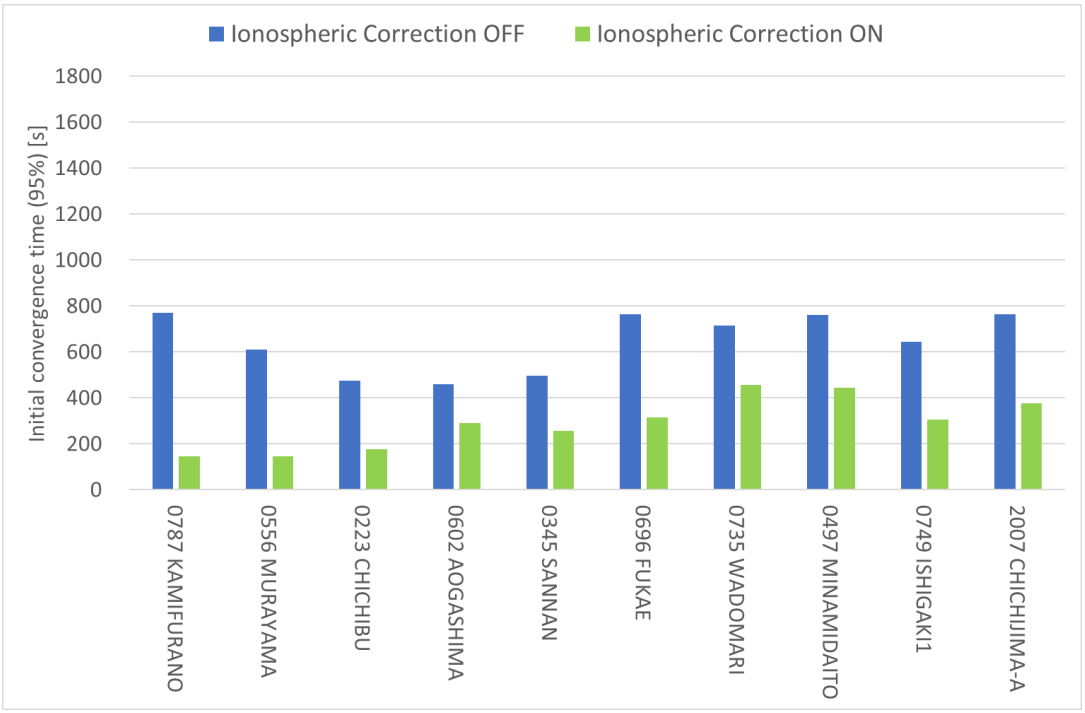

Figure 3.1-2 Initial Convergence Time (Japan)

Table 3.1-1 Initial Convergence Time (Asia and Oceania)

#	Station	Ionospheric correction	2025					
			Apr.	May	Jun.	Jul.	Aug.	Sep.
1.1	KAT100AUS	OFF	390	420	420	360	360	330
		ON	330	240	300	180	240	150
1.2	TOW200AUS	OFF	570	360	390	300	270	240
		ON	420	120	150	90	150	60
1.3	BULA00AUS	OFF	390	420	420	930	870	1260
		ON	210	210	300	120	150	660
1.4	MCHL00AUS	OFF	540	510	510	420	390	390
		ON	210	150	270	180	120	150
1.5	TBOB00AUS	OFF	870	960	1020	900	900	870
		ON	390	420	480	300	300	660
1.6	CBLT00AUS	OFF	600	570	600	480	510	510
		ON	210	210	270	90	60	60
1.7	MOBS00AUS	OFF	420	450	450	390	360	360
		ON	210	210	180	30	30	60
1.8	HOB200AUS	OFF	450	510	480	360	330	330
		ON	90	30	30	0	30	90
1.9	CEDU00AUS	OFF	450	450	480	450	390	360
		ON	240	270	180	30	30	60
1.10	NNOR00AUS	OFF	630	660	660	540	510	510
		ON	300	300	180	90	60	150
1.11	ALIC00AUS	OFF	390	420	420	360	330	330
		ON	210	240	210	30	60	60
1.12	WLAL00AUS	OFF	390	450	450	390	330	330
		ON	240	330	360	180	180	210
2.1	PCDN00PHL	OFF				870	1650	1800
		ON				870	1650	1800
2.2	PTGG00PHL	OFF	510	540	570	660	480	480
		ON	180	300	210	180	330	360
2.3	PCEB00PHL	OFF	630	630	660	510	510	450
		ON	150	270	240	300	510	450
2.4	PDUM00PHL	OFF	1230	1260	1230	960	1050	960
		ON	420	540	570	630	1050	960
2.5	PNDO00PHL	OFF	1710	1800	1800	1800	1800	
		ON	1800	1800	870	1800	1800	
3.1	CIBG00IDN	OFF	690	780	750	720	690	840
		ON	360	330	240	30	30	240

unit [s]

Table 3.1-2 Initial Convergence Time (Japan)

#	Station	Ionospheric correction	2025					
			Apr.	May	Jun.	Jul.	Aug.	Sep.
4.1	0787 KAMIFURANO	OFF	810	810	930	810	660	600
		ON	60	120	270	300	90	30
4.2	0556 MURAYAMA	OFF	630	600	690	600	630	510
		ON	120	60	300	150	180	60
4.3	0223 CHICHIBU	OFF	420	450	480	570	480	450
		ON	180	90	240	240	180	120
4.4	0602 AOGASHIMA	OFF	420	450	450	510	420	510
		ON	390	300	300	210	240	300
4.5	0345 SANNAN	OFF	450	450	480	540	570	480
		ON	300	270	360	180	240	180
4.6	0696 FUKAE	OFF	720	750	780	780	810	750
		ON	390	360	480	180	270	210
4.7	0735 WADOMARI	OFF	720	720	750	750	630	720
		ON	660	450	480	390	270	480
4.8	0497 MINAMIDAITO	OFF	810	900	780	810	630	630
		ON	630	480	480	390	270	420
4.9	0749 ISHIGAKI1	OFF	600	570	690	750	540	720
		ON	390	360	420	240	150	270
4.10	2007 CHICHIJIMA-A	OFF	840	840	870	780	630	630
		ON	600	390	450	300	240	270

unit [s]

3.2. Positioning Accuracy after Convergence

See Figure 3.2-1, 2, 3, 4, Table 3.2-1,2,3 and Table 3.2-4.

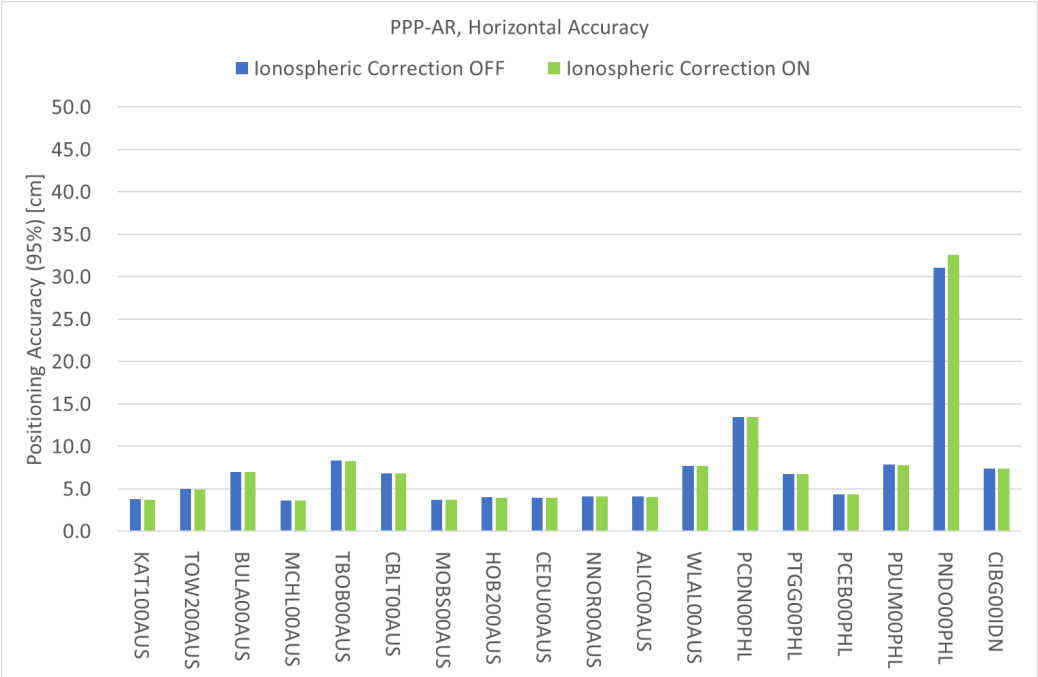

Figure 3.2-1 Horizontal Positioning Accuracy after Convergence (Asia and Oceania)

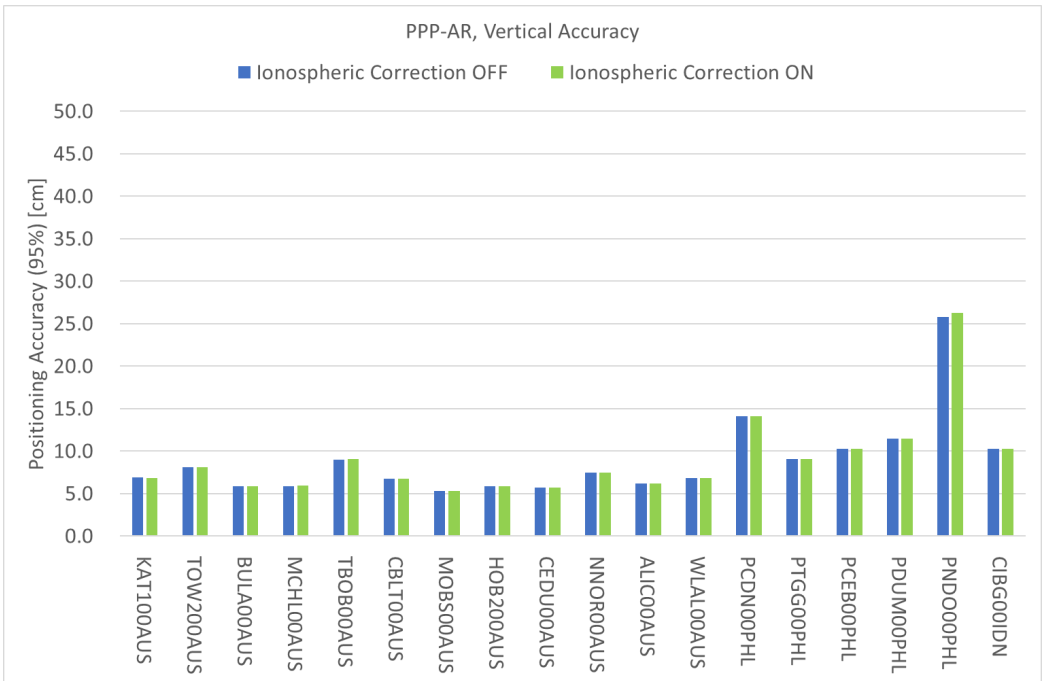

Figure 3.2-2 Vertical Positioning Accuracy after Convergence (Asia and Oceania)

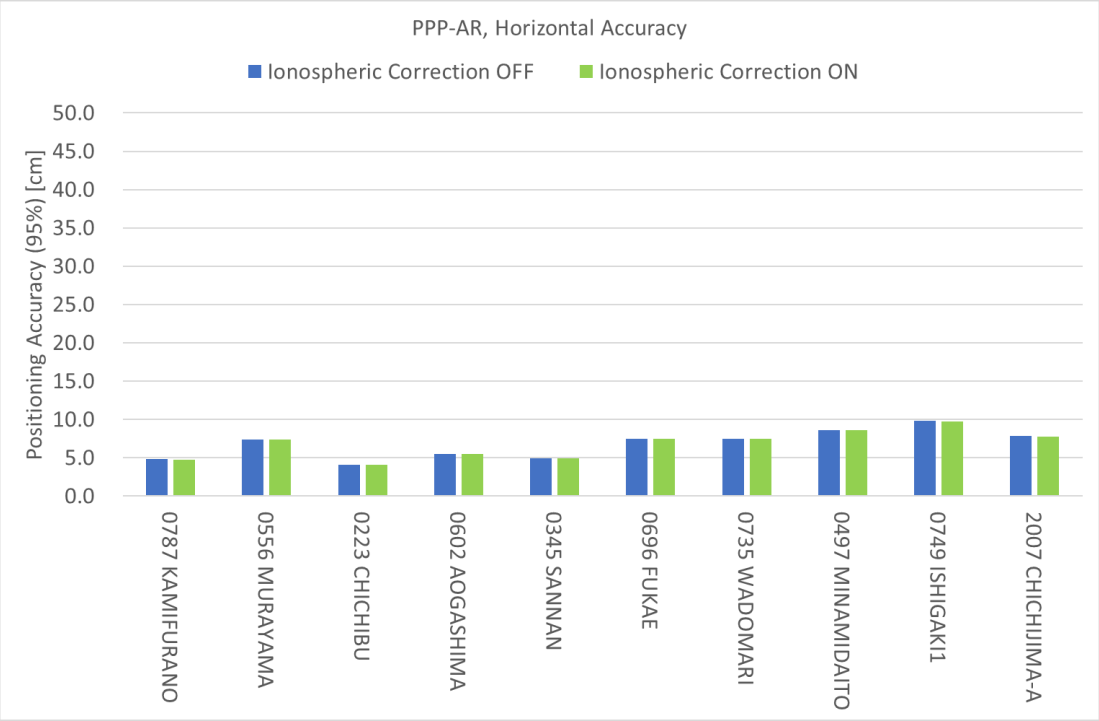

Figure 3.2-3 Horizontal Positioning Accuracy after Convergence (Japan)

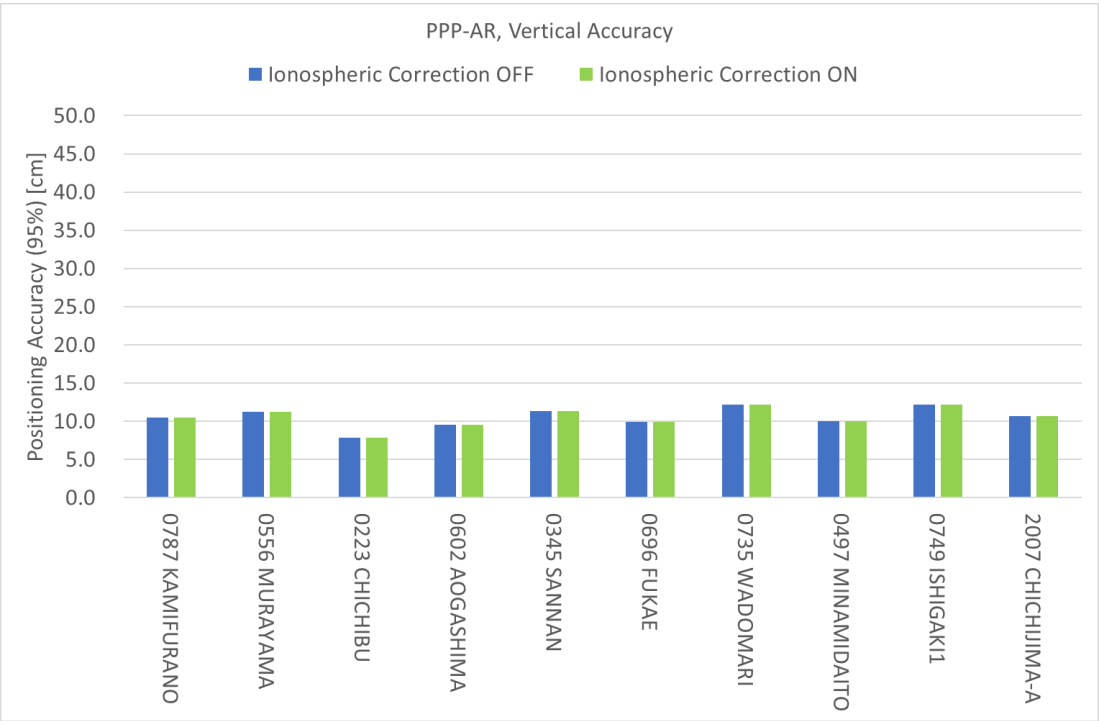

Figure 3.2-4 Vertical Positioning Accuracy after Convergence (Japan)

Table 3.2-1 Horizontal Positioning Accuracy after Convergence (Asia and Oceania)

#	Station	Ionospheric correction	2025					
			Apr.	May	Jun.	Jul.	Aug.	Sep.
1.1	KAT100AUS	OFF	3.1	3.3	5.6	5.0	2.5	3.3
		ON	3.1	3.3	5.2	5.0	2.5	3.3
1.2	TOW200AUS	OFF	10.7	3.3	4.9	5.0	2.6	3.3
		ON	10.5	3.3	4.7	5.0	2.6	3.3
1.3	BULA00AUS	OFF	4.03	4.39	4.7	9.0	9.6	10.3
		ON	4.04	4.4	4.7	9.0	9.6	10.3
1.4	MCHL00AUS	OFF	3.1	3.3	4.9	5.6	2.4	2.8
		ON	3.1	3.3	4.7	5.6	2.4	2.8
1.5	TBOB00AUS	OFF	5.01	5.55	6.5	10.3	11.2	11.6
		ON	5.16	5.43	6.2	10.3	11.1	11.5
1.6	CBLT00AUS	OFF	4.38	4.52	4.7	8.5	9.1	9.5
		ON	4.39	4.58	4.7	8.5	9.1	9.5
1.7	MOBS00AUS	OFF	3.3	3.6	4.6	5.7	2.4	2.8
		ON	3.3	3.5	4.5	5.7	2.4	2.8
1.8	HOB200AUS	OFF	3.72	3.84	4.8	5.4	2.8	3.4
		ON	3.71	3.83	4.7	5.4	2.8	3.4
1.9	CEDU00AUS	OFF	3.1	3.83	5.9	5.6	2.6	2.9
		ON	3.1	3.79	5.8	5.6	2.6	2.9
1.10	NNOR00AUS	OFF	3.4	4.3	5.5	5.0	3.1	3.5
		ON	3.4	4.4	5.3	5.0	3.1	3.5
1.11	ALIC00AUS	OFF	2.8	4.2	6.7	5.4	2.5	3.0
		ON	2.8	4.2	6.5	5.4	2.5	3.0
1.12	WLAL00AUS	OFF	5.1	4.9	5.3	9.6	10.4	11.1
		ON	5.2	4.9	5.2	9.7	10.4	11.1
2.1	PCDN00PHL	OFF				8.9	17.6	14.0
		ON				8.9	17.6	14.0
2.2	PTGG00PHL	OFF	9.6	9.3	9.6	4.8	3.6	3.6
		ON	9.6	9.4	9.6	4.8	3.6	3.6
2.3	PCEB00PHL	OFF	4.3	4.9	5.5	3.6	4.2	3.8
		ON	4.2	4.9	5.4	3.6	4.2	3.8
2.4	PDUM00PHL	OFF	9.1	8.9	8.4	7.9	5.4	7.5
		ON	8.8	9.0	8.1	7.8	5.4	7.5
2.5	PNDO00PHL	OFF	23.4	27.4	27.7	45.5	31.4	
		ON	31.0	28.9	25.8	46.1	31.4	
3.1	CIBG00IDN	OFF	9.1	8.8	9.6	6.4	4.7	5.9
		ON	9.1	8.8	9.6	6.4	4.7	5.9

unit [cm]

Table 3.2-2 Vertical Positioning Accuracy after Convergence (Asia and Oceania)

#	Station	Ionospheric correction	2025					
			Apr.	May	Jun.	Jul.	Aug.	Sep.
1.1	KAT100AUS	OFF	7.5	7.2	7.8	6.0	6.3	6.5
		ON	7.5	7.2	7.8	6.0	6.3	6.5
1.2	TOW200AUS	OFF	13.3	8.4	9.2	6.2	5.6	5.7
		ON	13.4	8.4	9.3	6.2	5.6	5.7
1.3	BULA00AUS	OFF	5.06	5.68	6.7	5.9	5.8	6.2
		ON	5.05	5.7	6.7	5.9	5.8	6.2
1.4	MCHL00AUS	OFF	5.6	6.2	6.7	5.7	5.4	5.9
		ON	5.6	6.2	6.8	5.7	5.4	5.9
1.5	TBOB00AUS	OFF	8.47	9.14	9.9	9.4	8.4	8.9
		ON	8.47	9.28	9.7	9.4	8.4	8.9
1.6	CBLT00AUS	OFF	6.99	7.05	7.8	6.5	6.1	6.0
		ON	7.05	7.06	7.9	6.5	6.1	6.0
1.7	MOBS00AUS	OFF	4.9	5.5	5.8	5.1	5.0	5.4
		ON	4.9	5.5	5.8	5.1	5.0	5.4
1.8	HOB200AUS	OFF	5.74	5.76	6.0	5.9	5.8	6.1
		ON	5.72	5.76	5.9	5.9	5.8	6.1
1.9	CEDU00AUS	OFF	5.1	5.99	7.8	5.5	5.4	4.6
		ON	5.1	5.97	7.9	5.5	5.4	4.6
1.10	NNOR00AUS	OFF	7.3	7.5	9.3	7.5	7.1	6.1
		ON	7.3	7.5	9.2	7.5	7.1	6.1
1.11	ALIC00AUS	OFF	5.7	7.2	8.0	5.4	5.5	5.5
		ON	5.7	7.2	7.9	5.4	5.5	5.5
1.12	WLAL00AUS	OFF	7.2	7.3	6.9	6.5	6.8	6.3
		ON	7.2	7.2	6.8	6.5	6.8	6.3
2.1	PCDN00PHL	OFF				10.0	13.6	18.8
		ON				10.0	13.6	18.8
2.2	PTGG00PHL	OFF	9.8	10.8	12.0	8.0	7.2	6.8
		ON	9.8	10.8	12.0	8.0	7.2	6.8
2.3	PCEB00PHL	OFF	11.9	11.2	12.5	9.4	8.3	8.4
		ON	11.8	11.2	12.5	9.4	8.3	8.4
2.4	PDUM00PHL	OFF	13.6	12.4	11.7	10.6	10.2	10.5
		ON	13.3	12.4	11.7	10.6	10.2	10.5
2.5	PNDO00PHL	OFF	22.6	28.8	24.3	28.2	25.0	
		ON	23.9	29.6	24.1	28.5	25.0	
3.1	CIBG00IDN	OFF	9.7	11.5	11.9	9.4	10.2	9.2
		ON	9.8	11.5	11.9	9.4	10.2	9.2

unit [cm]

Table 3.2-3 Horizontal Positioning Accuracy after Convergence (Japan)

#	Station	Ionospheric correction	2025					
			Apr.	May	Jun.	Jul.	Aug.	Sep.
4.1	0787 KAMIFURANO	OFF	4.6	5.1	5.9	4.7	4.6	3.9
		ON	4.4	5.0	6.3	4.7	4.5	3.9
4.2	0556 MURAYAMA	OFF	5.3	5.8	6.2	8.6	9.3	9.3
		ON	5.3	5.9	6.2	8.6	9.2	9.3
4.3	0223 CHICHIBU	OFF	3.4	4.1	4.5	4.6	4.4	3.6
		ON	3.3	4.1	4.6	4.6	4.4	3.6
4.4	0602 AOGASHIMA	OFF	5.6	6.1	6.8	5.4	4.3	4.4
		ON	5.6	6.1	6.9	5.4	4.3	4.4
4.5	0345 SANNAN	OFF	3.0	3.3	4.2	6.1	6.9	6.3
		ON	3.0	3.3	4.2	6.1	6.9	6.3
4.6	0696 FUKAE	OFF	5.5	6.3	6.2	8.5	9.4	9.2
		ON	5.6	6.3	6.1	8.5	9.3	9.2
4.7	0735 WADOMARI	OFF	5.3	5.9	6.1	8.6	9.1	9.6
		ON	5.3	5.9	6.0	8.6	9.1	9.6
4.8	0497 MINAMIDAITO	OFF	7.8	10.5	10.0	8.7	7.1	7.7
		ON	7.7	10.4	10.1	8.7	7.1	7.7
4.9	0749 ISHIGAKI1	OFF	7.3	8.2	8.7	11.1	11.5	12.0
		ON	7.3	8.1	8.6	11.1	11.5	12.0
4.10	2007 CHICHIJIMA-A	OFF	7.8	8.8	9.0	7.8	6.6	7.1
		ON	7.7	8.4	9.1	7.8	6.6	7.0

unit [cm]

Table 3.2-4 Vertical Positioning Accuracy after Convergence (Japan)

#	Station	Ionospheric correction	2025					
			Apr.	May	Jun.	Jul.	Aug.	Sep.
4.1	0787 KAMIFURANO	OFF	7.5	7.7	9.1	12.0	13.2	13.3
		ON	7.6	7.8	9.1	12.0	13.2	13.2
4.2	0556 MURAYAMA	OFF	8.3	8.9	9.2	12.1	14.3	14.9
		ON	8.3	8.9	9.2	12.1	14.3	14.9
4.3	0223 CHICHIBU	OFF	6.9	8.3	8.9	8.0	8.3	6.9
		ON	7.0	8.3	8.9	7.9	8.3	6.9
4.4	0602 AOGASHIMA	OFF	9.2	9.6	9.7	9.6	9.8	9.5
		ON	9.2	9.6	9.7	9.6	9.7	9.5
4.5	0345 SANNAN	OFF	8.0	8.5	8.9	13.7	14.4	14.8
		ON	8.0	8.6	8.9	13.7	14.4	14.8
4.6	0696 FUKAE	OFF	9.0	10.0	9.5	10.0	11.1	10.2
		ON	9.0	10.0	9.4	10.0	11.0	10.2
4.7	0735 WADOMARI	OFF	10.2	10.9	10.4	13.3	13.6	14.7
		ON	10.1	10.9	10.5	13.2	13.5	14.6
4.8	0497 MINAMIDAITO	OFF	9.7	11.0	10.2	10.4	9.2	9.8
		ON	9.6	11.0	10.2	10.4	9.2	9.8
4.9	0749 ISHIGAKI1	OFF	10.0	11.2	10.0	13.6	13.5	14.9
		ON	10.0	11.1	10.0	13.6	13.5	14.9
4.10	2007 CHICHIJIMA-A	OFF	12.7	12.5	12.0	9.4	8.3	9.4
		ON	12.7	12.6	12.0	9.4	8.3	9.4

unit [cm]

Appendix 95% accuracy and fix-ratio over time

Figures A-1 through A-4 show the trend of 95% accuracy over time following PPP initialization in September 2025. These figures illustrate cases with and without ionospheric correction for Asia-Oceania region and Japan. Specifically, Figures A-1 and A-3 present the cases without ionospheric correction, while Figures A-2 and A-4 show the cases with ionospheric correction.

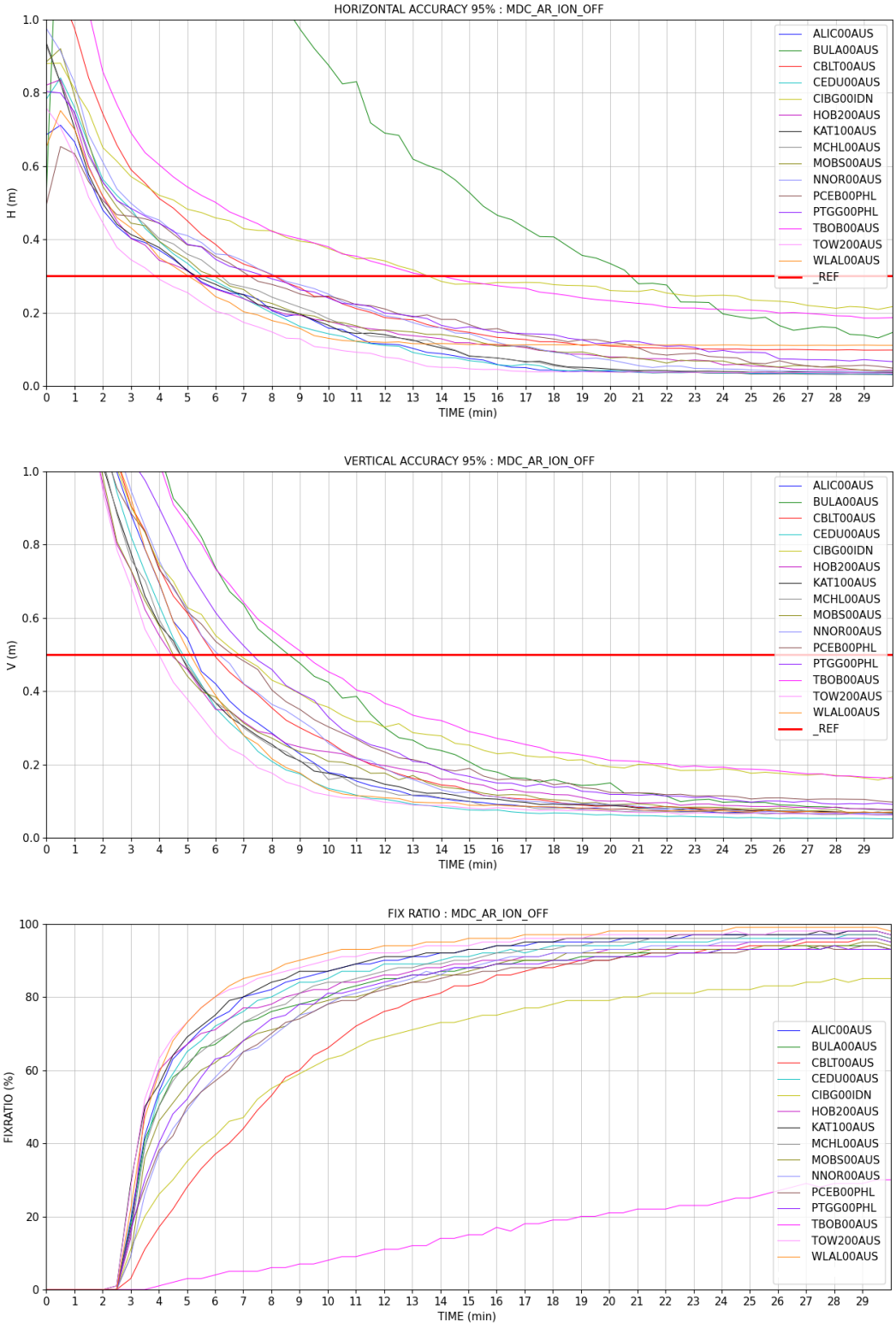

Figure A-1 Trend of 95% Percentile Accuracy Over Time (ION-OFF, Asia and Oceania)

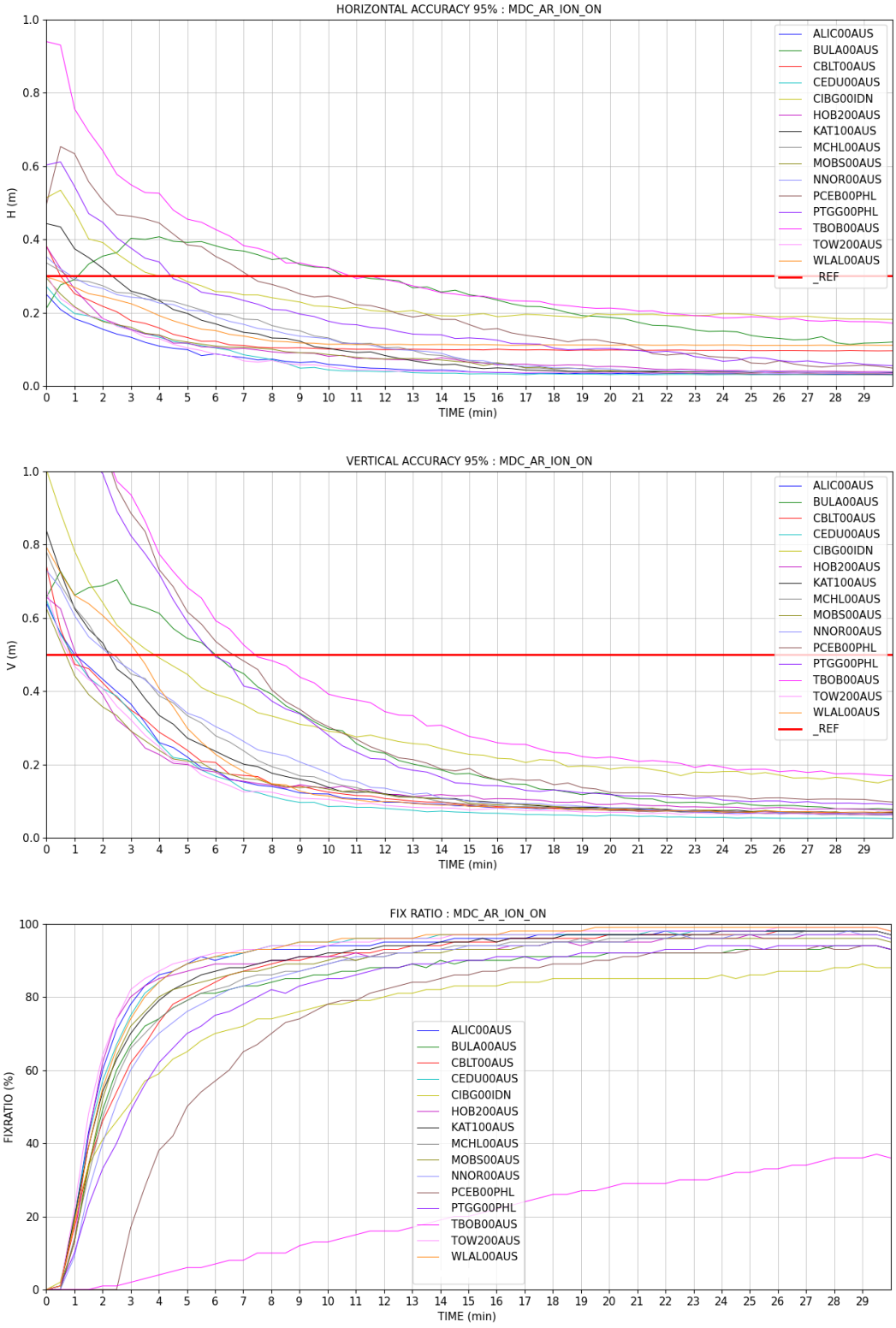

Figure A-2 Trend of 95% Percentile Accuracy Over Time (ION-OFF, Asia and Oceania)

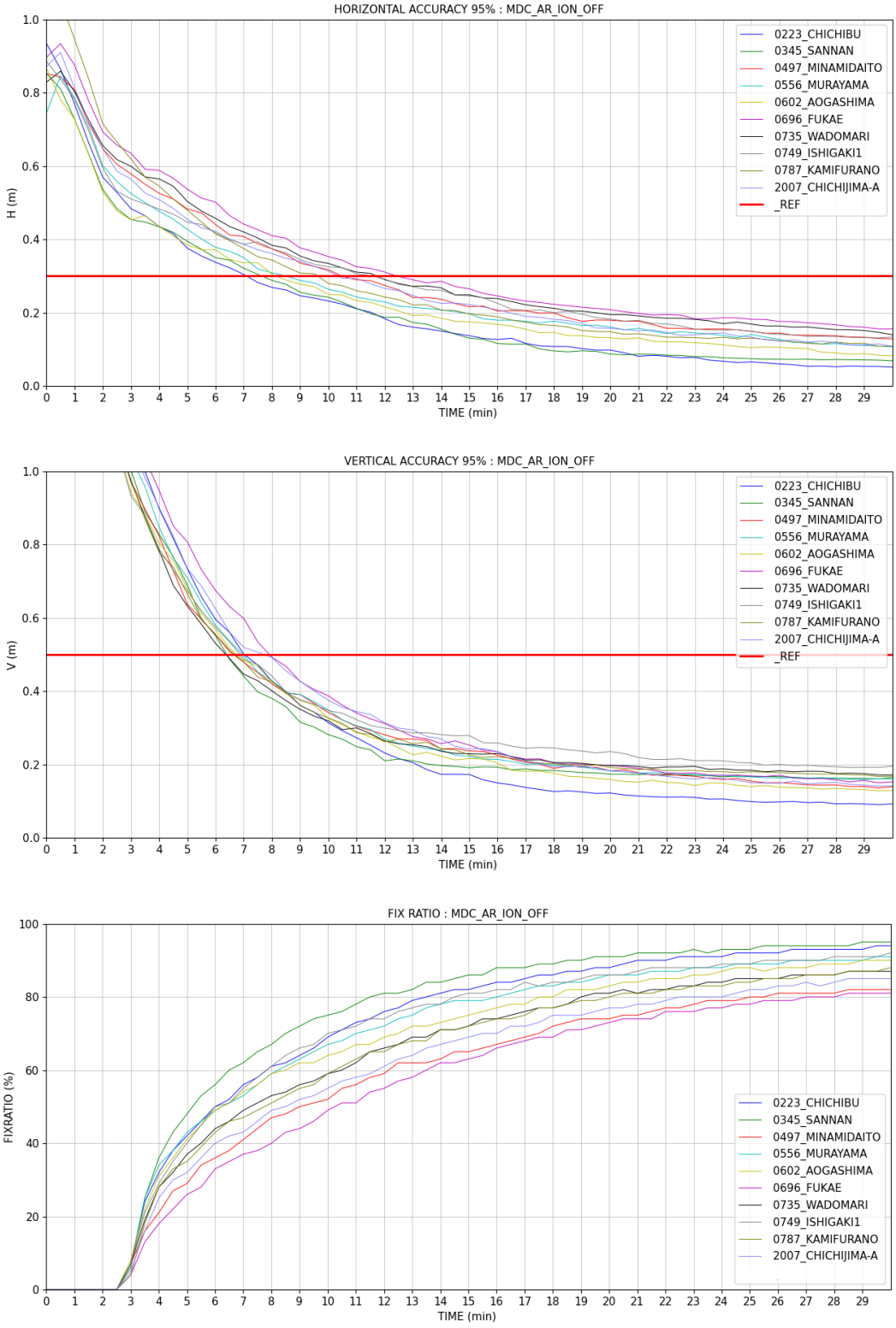

Figure A-3 Trend of 95% Percentile Accuracy Over Time (ION-OFF, Japan)

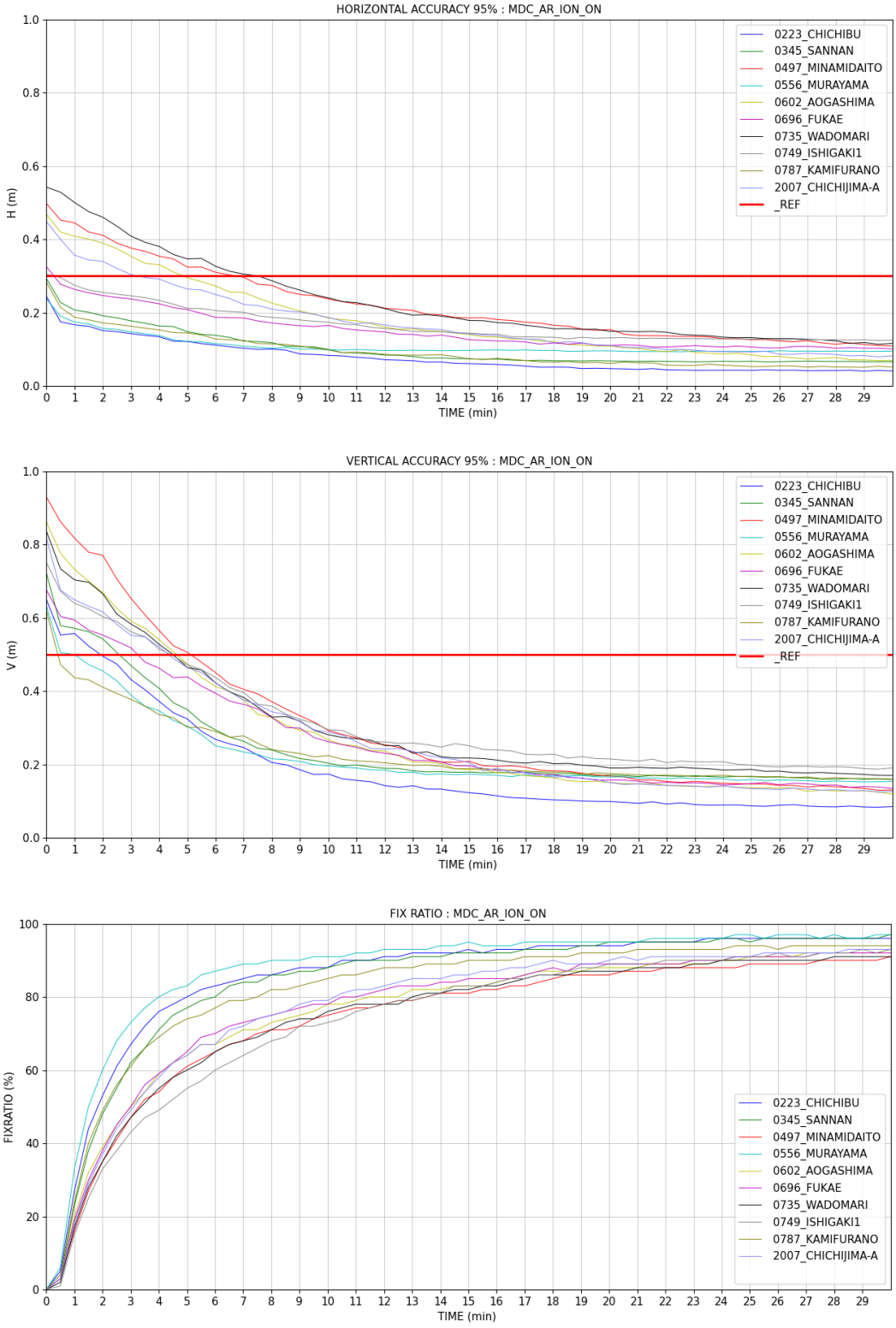

Figure A-4 Trend of 95% Percentile Accuracy Over Time (ION-ON, Japan)