

Project Overview of the Quasi-Zenith Satellite System

February 7, 2017

Committee on the Peaceful Uses of Outer Space
Scientific and Technical Subcommittee
54th Session



QZSS Strategy Office,
National Space Policy Secretariat
Cabinet Office, Government of Japan

System Overview

Functional Capability:

GPS Complementary

GNSS Augmentation

Messaging Service

Coverage: Asia and Pacific region

Signals(QZS-1):

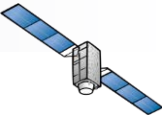
L1C/A, L1C, L2C and L5

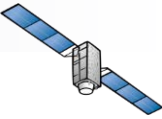
L1S (L1-SAIF) on 1575.42 MHz

L6 (LEX) on 1278.75MHz

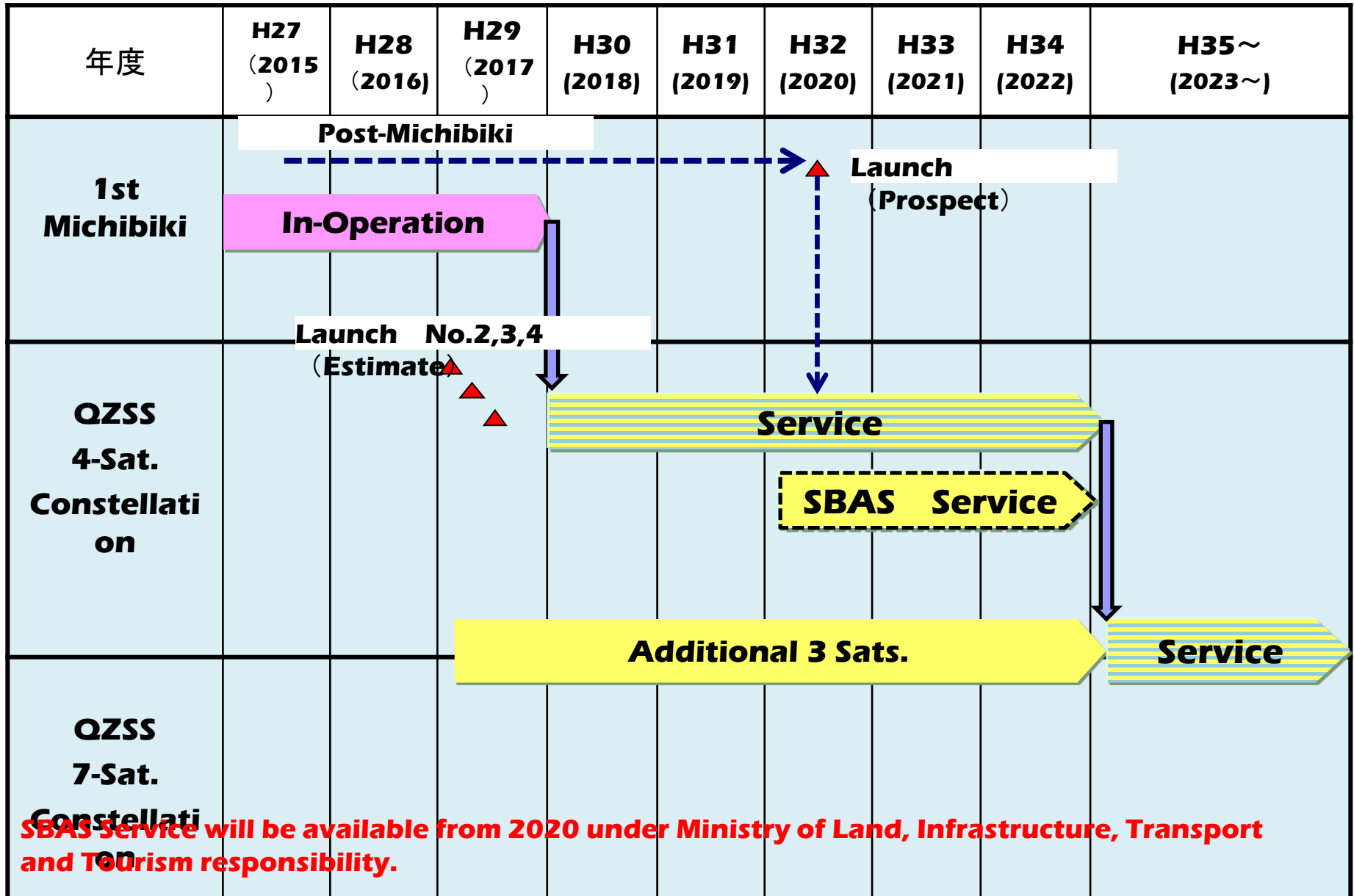
(Today) 1st QZSS satellite "MICHIBIKI"

Four satellites constellation will be established and the service will start in 2018.

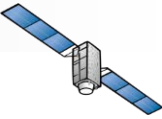




The QZSS Program Schedule (Update)



The QZSS Master Ground Station



http://www.mlit.go.jp/koku/15_bf_000367.html



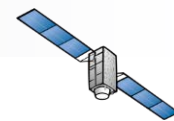
- ✓ **Two-Ground Station (Control Center) will be available in the end of 2016JFY.**
- ✓ **Initial Operation will be started from 2018.**

**QZSS Control Center
Kobe,**

**QZSS Control Center
Hitachi-Ohta,**



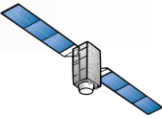
http://www.mlit.go.jp/koku/15_bf_0003



The QZSS TTC & Monitor Station

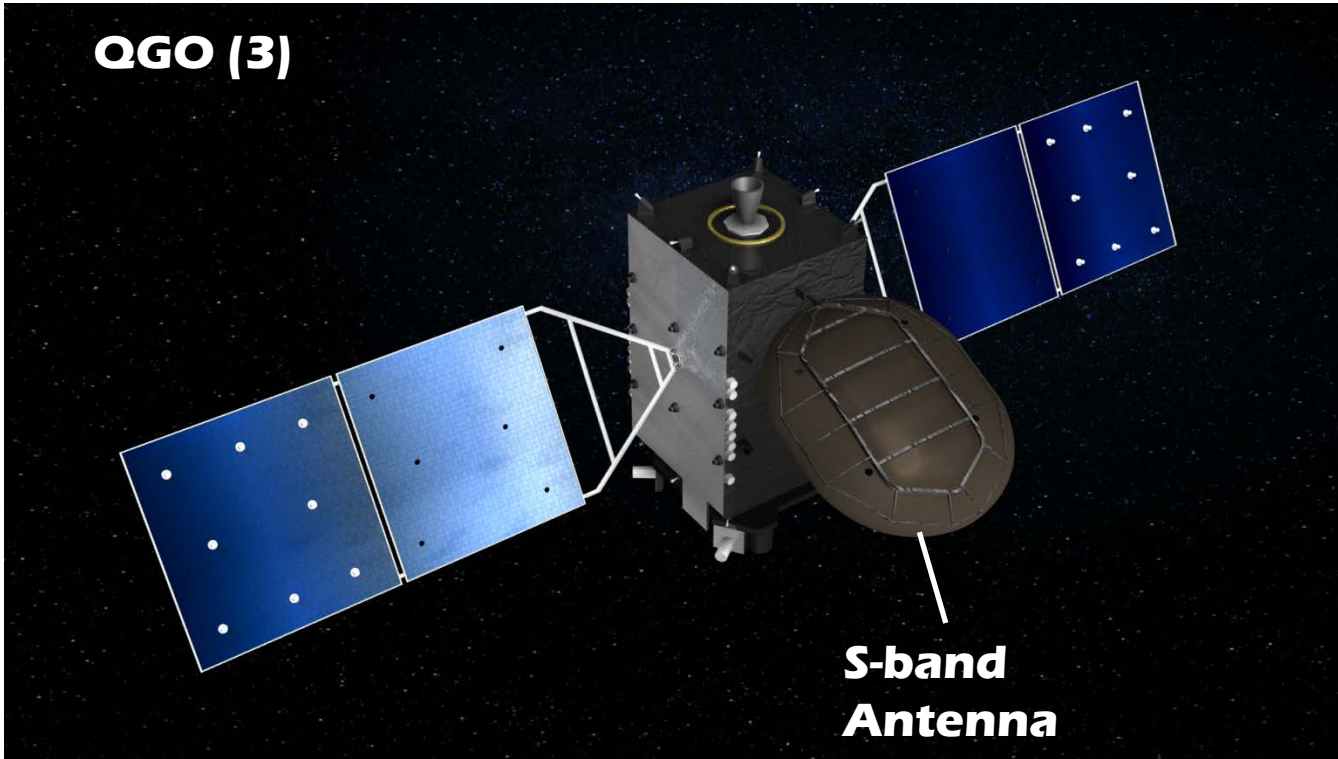
- ✓ **All of TTC monitor stations will be founded by the end of 2016.**
- ✓ **Initial Operation will be started from 2018.**





QZSS Satellite(s) Overview

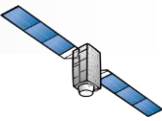
QGO (3)



Orbit Parameter	Nominal Allocation
Longitude	E 127
Latitude	0

Launch Vehicle : H- II A
Mass Dry/Launch : 1.8t/4.7t
Lifetime : 15years+

The QZSS Satellite(s) Overview



QZO (2,4)

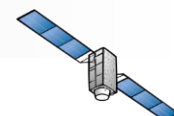


L-band

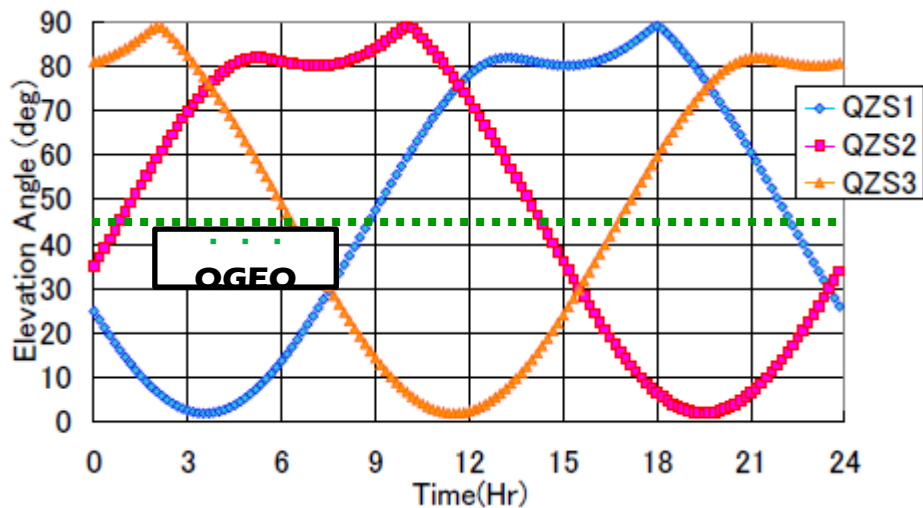


Orbit Parameter	Nominal Allocation
Semimajor Axis(A)	42164km
Eccentricity (e)	0.075
Inclination (i)	41 degree
Argument of Perigee(w)	270 degree
RAAN(Ω)	Block I_Q: 117 degree Block II_Q: 117±130 degree
Central Longitude (λ)	136 degree

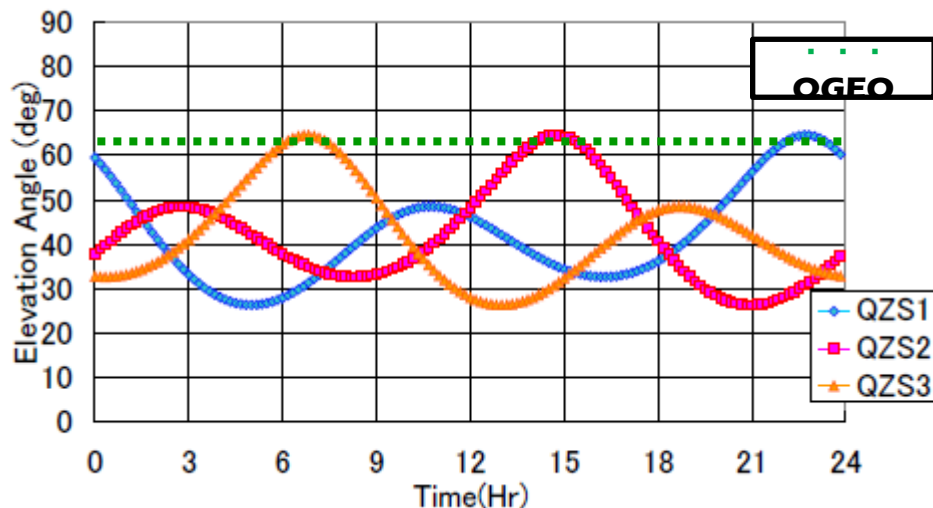
Launch Vehicle : H-Ⅱ A
Mass Dry/Launch : 1.6t/4.0t
Lifetime : 15years+



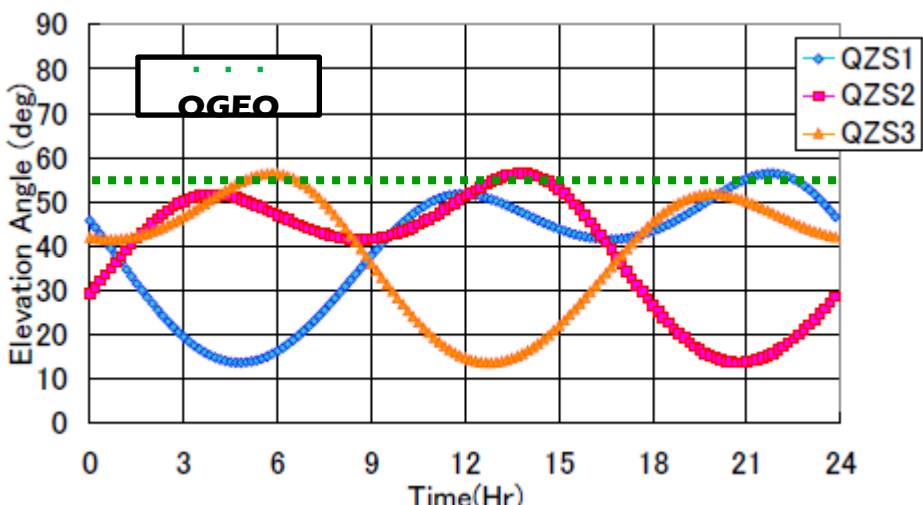
The QZSS Visibility Time



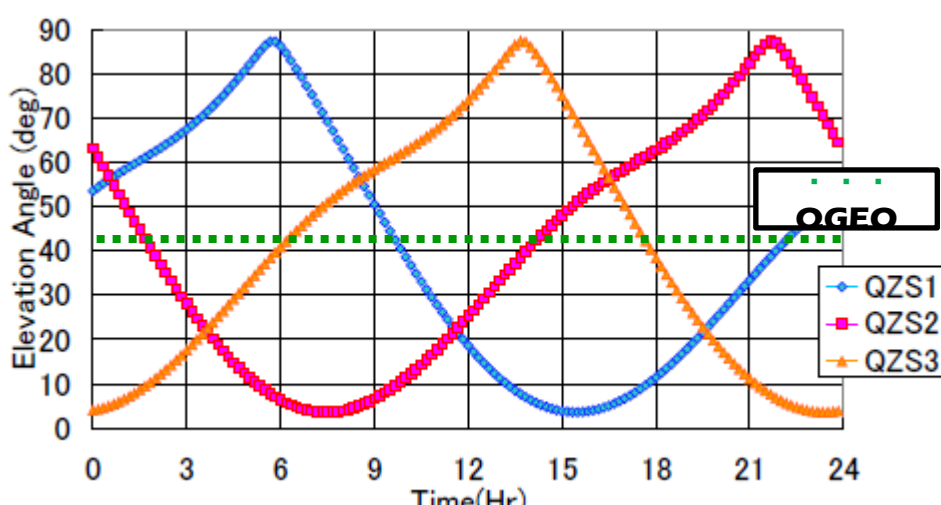
TOKYO



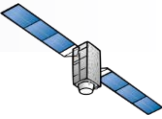
SINGAPORE



BANGKOK



SYDNEY



Positioning Signals of the QZSS

Positioning Signal of QZSS

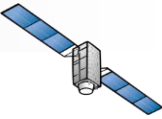
Not only positioning complementation signal, but satellite orbit, time, and ionosphere correction information will be also transmitted as augment information.

				1 st Satellite		2 nd -4 th Satellite	
				QZO	QZO	GEO	
L1C/A	1575.42 MHz	Positioning	complement GPS	○	○	○	
L1C		Positioning	complement GPS	○	○	○	
L1S		Augmentation (SLAS)		○	○	○	
L2C	1227.60 MHz	Positioning	complement GPS	○	○	○	
L5	1176.45 MHz	Positioning	complement GPS	○	○	○	
L5S		Augmentation Experimental		—	○	○	
L1Sb	1575.42 MHz	Augmentation	SBAS	—	—	○	
L6	1278.75 MHz	Augmentation (GLAS)	2020.	○	○	○	

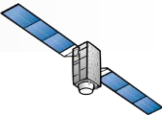
Summary



QZSS



- ✓ **The Navigation Satellite System is an important next-generation social infrastructure.**
- ✓ **Industrial use such as autonomous driving, railway, agriculture etc. is expanding.**
- ✓ **Research and development of fundamental technology related to GNSS is extremely important, and the field where space science technology is directly linked to services in daily life.**
- ✓ **Japan also owns its own navigation satellite system ("Quasi-Zenith Satellite System"), and is promoting the project with the "all-Japan" system.**
- ✓ **Through MGA(Multi GNSS Asia) activity and others, we are working on capacity building of GNSS with countries of Asia Pacific region.**



Thank you for your attention.

ありがとう ! おおきに !

ขอบคุณ ครับ !

Merci

beaucoup !

Grazie !

Благодарю !

Gracias

谢谢 !

شُكْرًا !

!

Danke schön !

Obrigado

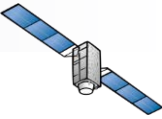
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For more information, please visit our web site

Terima

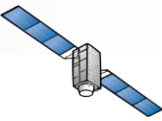
<http://qzss.go.jp/en/>

고맙습니다 !



- **A large circle illustrated “Q” as Quasi-Zenith Satellite System**
- **Green and blue circle composes 8 shapes; the coverage area of QZSS and they are represented earth and satellite.**
- **Blue line symbolized precise positioning information as well as enlargement of brand new service to society.**
- **Color of green stands for environment and safety, and blue stands for space and technology**

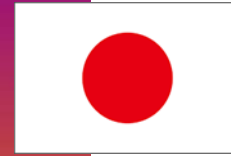
ICG(International Committee on GNSS)-12 Schedule (Draft)



	Saturday 2 December	Sunday 3 December	Monday 4 December	Tuesday 5 December	Wednesday 6 December	Thursday 7 December
8:00		Registration	Registration	Registration		
9:00		1st Plenary Session of ICG	WG S	WG C	Joint WG S, WG B, WG C, WG D Meeting WG S WG B WG C WG D	3rd Plenary Session of ICG
10:00						
11:00				WG B WG D	2nd Plenary Session of ICG	
12:00	Registration	Group photo Lunch	Lunch	Lunch	Lunch	
13:00	1st Providers' Forum Meeting	Presentations by Members, Associate Members and Observers				
14:00				WG B WG D	2nd Plenary Session (continued)	
15:00			WG S	WG C		
16:00	WG Co-Chairs Meeting	Applications & Experts Session			2nd Providers' Forum Meeting	
17:00				City Tour Banquet		
18:00		Welcome Dinner				



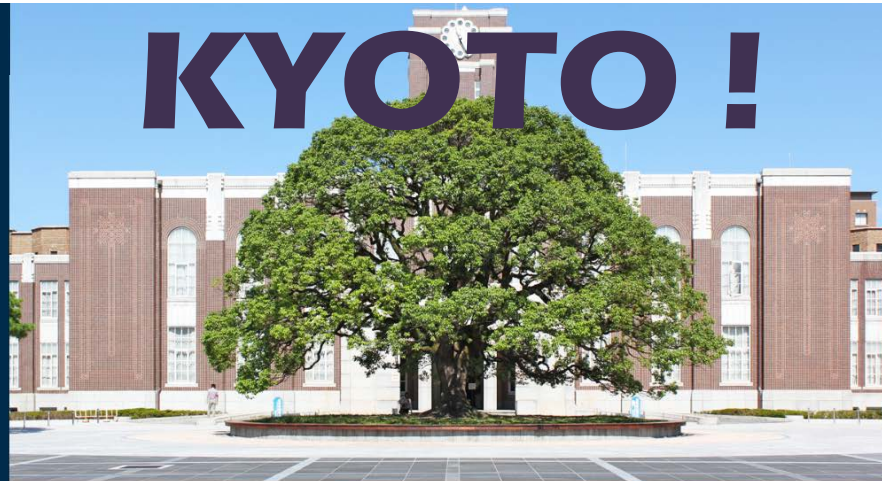
KYOTO, JAPAN
DECEMBER 2017



12th Meeting of the International Committee on Global Navigation Satellite Systems

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Welcome to KYOTO !



ICG-12 will be held in Kyoto, Japan from 2nd to 7th December, 2017.

Japan will host the twelfth Meeting of the International Committee on Global Navigation Satellite Systems (ICG-12) 2-7 December, 2017.

The meeting will be co-organized by the Cabinet Office, Government Of Japan and the Ministry of Foreign Affairs of Japan.

The details of the meeting including venue, program, accommodation, etc. will be posted on this website in due course.