Report on a Multi-GNSS Demonstration project in the Asia/Oceania region

- Asia Oceania is the “Showcase of New GNSS Era” -

Japan Aerospace Exploration Agency

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Visible satellite number (mask angle 30 degrees)

2020:

GPS(27)+Glonass(24)+Galileo(30)+COMPASS(35)+IRNSS(7)+QZSS(3)+SBAS(7)
Background
Showcase of New GNSS Era

• In Asia Oceania region, we can utilize
  Four major global systems
  – GPS (24 SVs in nominal constellation, currently 32 SVs)
  – GLONASS (24 SVs)
  – Galileo (27 + spare 3 = 30 SVs)
  – Future COMPASS (35 SVs)
  Plus two regional satellite PNT systems and SBAS
  – QZSS (3 SVs)
  – IRNSS (7 SVs)
  – MSAS, GAGAN (2 SVs, respectively)

• New modernized GNSS signals, multi-frequency and multi-GNSS signals can be utilized earlier rather than other region in the world
Background
Showcase of New GNSS Era

• User benefits from Multi GNSS
  – Increase in usable SVs, signals and frequencies
  – Increase in availability and coverage
  – More robust and reliable services
  – Higher accuracy in bad conditions
  – Less expensive high-end services

Emerging new and expanding existing applications are to be expected.
Multi-GNSS Demonstration Campaign

Objectives

• Encourage and promote the introduction and utilization of satellite PNT services in the Asia and Oceania region through assistance with the integration of GNSS services into their infrastructures;

• Promote new multi-GNSS utilization and applications in the region and feedback needs and requirements related to interoperability from user communities to GNSS providers

• Encourage GNSS provider and users in Asia Oceania region to develop new applications and carry out experiment or demonstration jointly.
Multi-GNSS Demonstration Campaign

Asia Oceania Multi-GNSS Demonstration Campaign

- is a series of activities for five years from 2010
- comprises the following parts

1. Multi-GNSS Monitoring Network
   - CORS (Continuously Operating Reference System), Data center, Analysis Center
   - Sharing resources and observed data among participated organization

2. Applications Development & Demonstration
   - Development of multi GNSS applications
   - Carrying out Experiments and Demonstrations

3. Regional Work Shop
   - Annual base Workshop in Asia Oceania region
   - Announcement of joint experiment plans and reporting results of the experiments
Progress after the previous ICG

• The concept of “Multi-GNSS demo. Campaign” was presented at ICG-4 and obtained endorsements from Two WGs (WG-A and D)

• The first regional Workshop was held at Bangkok, Thailand on January 25-26, 2010 successfully.
  – 195 participants from 18 countries
  – 4 discussion groups were established for future joint experiments
    1. Multi-GNSS observation network
    2. Disaster Mitigation and Management
    3. Precise Positioning
    4. ITS

• JAXA has just started a procurement for multi-GNSS receivers for the multi-GNSS observation network.
Next Steps

• Collaborations with relevant groups
  – Participation in their meetings and discussion how to collaborate with them
    • International GNSS Services
    • APEC GNSS Implementation Team
• Establishment an organization to manage the proposed campaign activity
  – is expected by the 2\textsuperscript{nd} workshop
• Second regional workshop
  – Currently plans to be held around the end of November.