

Real-time IGS Service Announced – Conclusions for EUREF

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Outline

- PPP-RTK symposium
- IGS announcement of real-time service
- Service providers point of view
- Manufacturers point of view
- Conclusions for EUREF
- Conclusions for National Mapping Agencies

PPP-RTK & Open Standards Symposium, March 12-13, 2012

BKG, Frankfurt
190 Participants
34 Countries



PPP-RTK Symposium Program

- Essentials
- Global Ionosphere
- Regional and Local Augmentations
- Phase Biases and Ambiguity Resolution
- Existing Services
- Emerging Services
- Product Dissemination

PPP Services

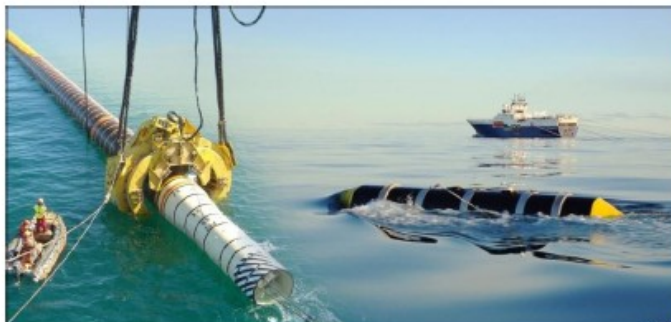
Existing

- Trimble RTX / OmniStar
- Fugro / SeaStar
- NavCom / John Deere
- VERIPOS
- Nexteq / i-PPP
- JPL / GDGPS
- RTCA: EGNOS, WAAS, SDCM

Emerging

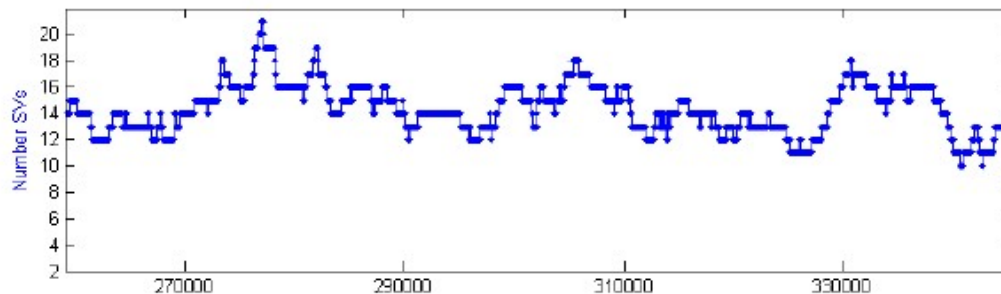
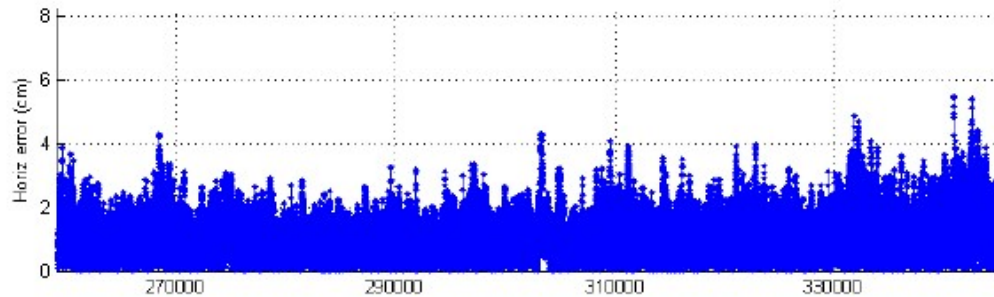
- QZSS Mitsubishi
- QZSS Jaxa
- Multi-constellation Augmentation incl. COMPASS, China
- IGS Real-time Service

Example 1: Fugro Offshore Positioning



Example 2: Trimble Regional RTX

Performance, Jan 11, 2012, 24 h, Chicago, Illinois: 21mm (95%)



24 hours



Initialization
in < 1 minute

Manufacturers' Policy

- So far no support of RTCM SSR Open Standard for PPP in receiver firmware visible
- Usually proprietary solutions
Example: Trimble RTX
- Usually Inmarsat-based product dissemination
Example: Fugro SeaStar
- Upcoming: More product dissemination via IP networks

Augmentation & Assistance

Innovation: Coming Soon

June 1, 2012

By: Mark Caissy, Loukis Agrotis, Georg Weber, Manuel Hernandez-Pajares, Urs Hugentobler

The International GNSS Real-Time Service

The International GNSS Service has embarked on a project to provide a high-accuracy GPS satellite orbit and clock data service in real time. The service will also provide 1-Hz data streams of GPS and GLONASS data from a network of global continuously operating reference stations. The IGS real-time data and orbit and clock products will be of immense benefit for geoscience studies and a host of other science and engineering applications. A team of authors associated with this project discusses the genesis and status of the real-time service and the plans to provide an initial operating capability.

INNOVATION INSIGHTS with Richard Langley

IGS Real-time GNSS Service

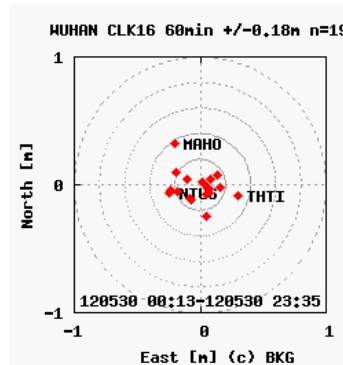
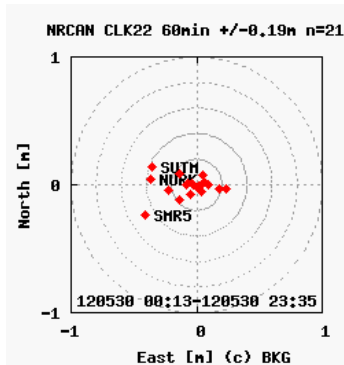
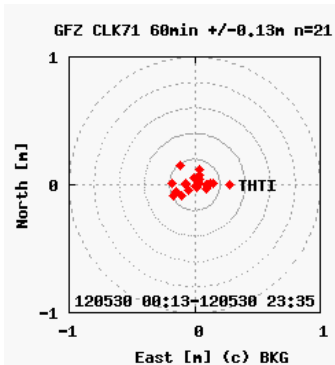
- Real-time IGS Working Group since 2001
- Real-time Pilot Project since 2007
- Analysis Centers:
BKG, CNES, CTU, DLR, ESA, Geo++, GMV, GZF,
NRCan, Wuhan
- Upcoming IOC announced

Why is IGS Involved in Real-Time GNSS?

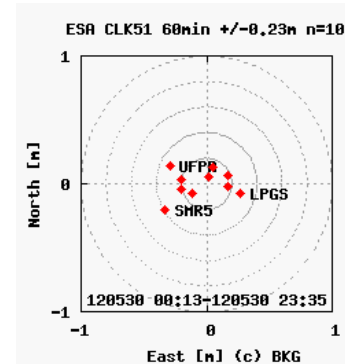
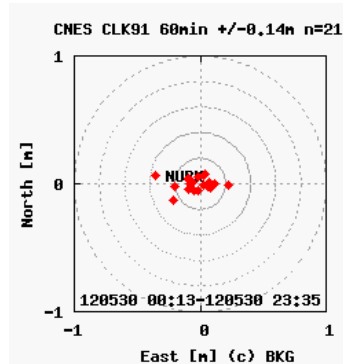
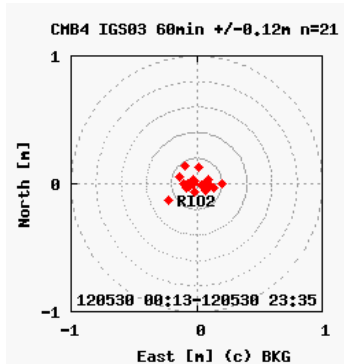
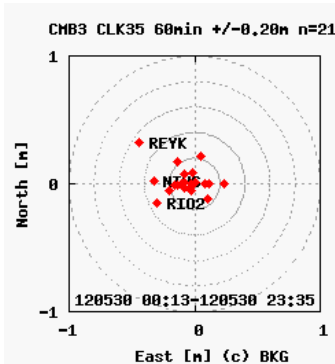
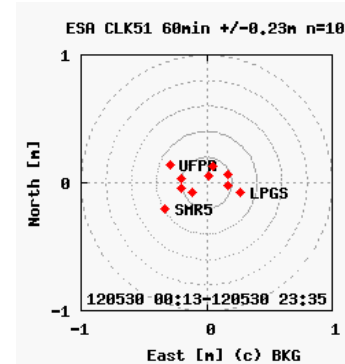
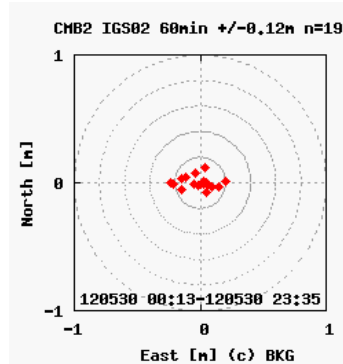
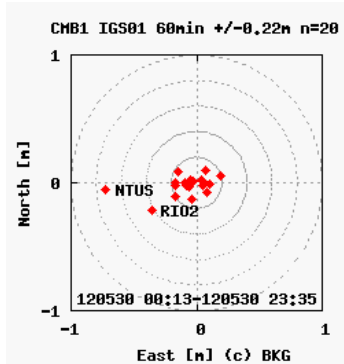
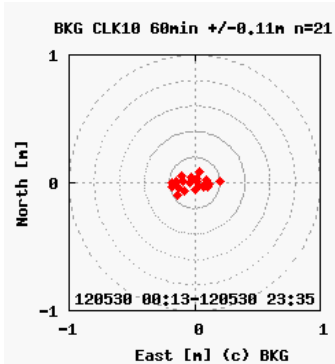
Support research organizations, national mapping agencies, NGOs

- GNSS performance monitoring
- Rapidly detecting, locating, and characterizing hazardous events such as earthquakes and tsunamis
- Geophysical hazard detection and warning systems
- Space weather forecasting

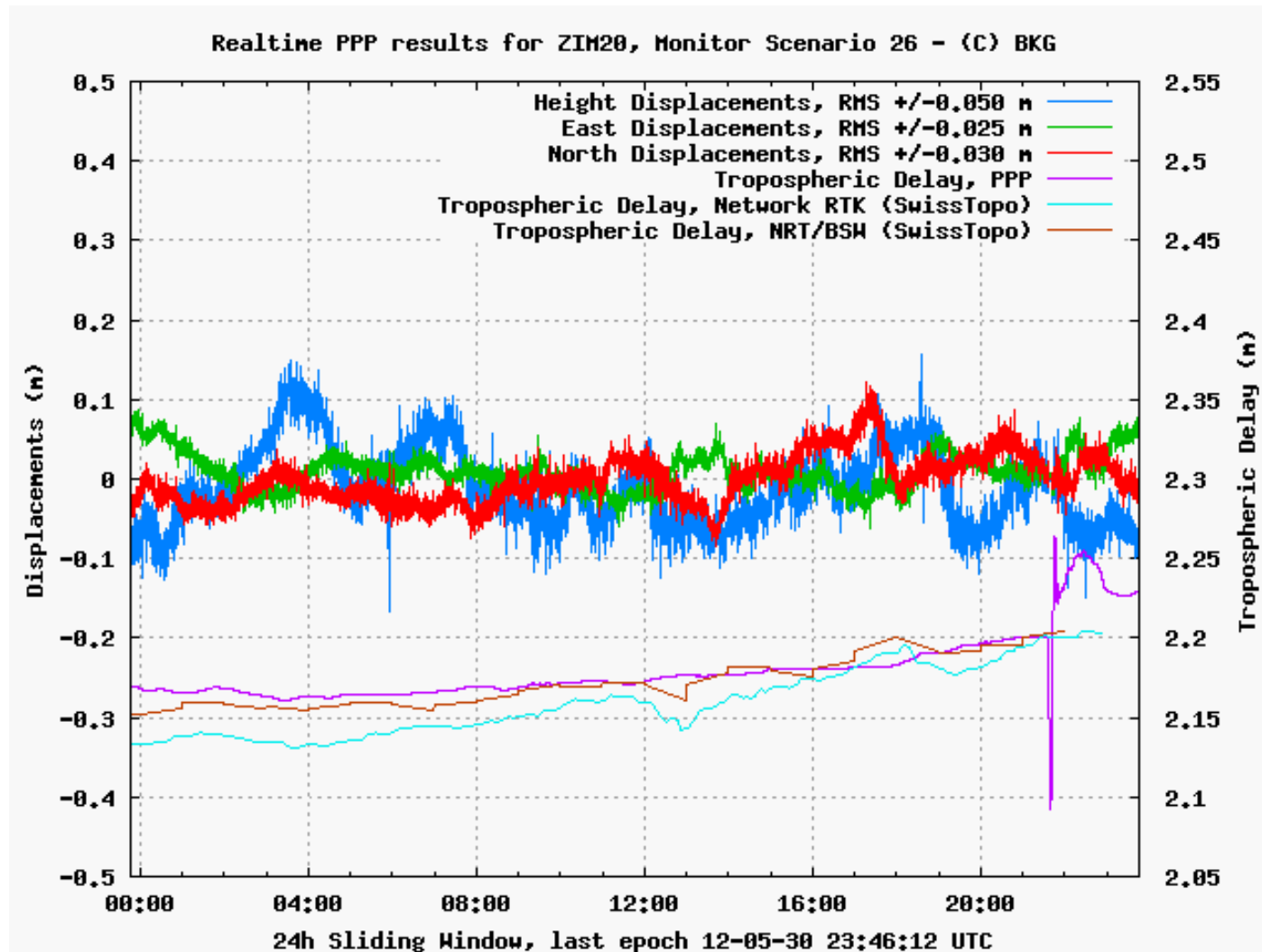
IGS Real-time GNSS Service, Status



Convergence
May 30th, 2012



EUREF GPS+GLO PPP in ETRF2000, Combined From CNES, DLR, BKG/CTU, GMV – May 30th, 2012



EUREF: How to proceed?

- PPP in ETRF2000 through ETRF2000 Orbits?
- EPN Real-time Coordinate Monitoring?
- Help in developing Open Standard for PPP with Ambiguity Resolution and PPP with Regional Augmentation
- Setup/Maintain independent European continental PPP service resources in cooperation with NMAs
- Convince manufacturers to support RTCM SSM messages in receiver firmware

NMAs: How to proceed?

- Pick up EUREF's PPP product for further dissemination through national Ntrip resources
- Test & validate EUREF's PPP in your country, Open Source software available through BNC and RTKLIB
- Consider making use of EUREF's real-time product part of your national real-time product portfolio
- Convince manufacturers to support RTCM SSM messages in receiver firmware
- Today's Network RTK resources will not become obsolete, PPP-RTK just develops towards an alternative

Further RTCM Standardization for PPP

- Will add messages for global ionosphere and phase biases to allow Ambiguity Resolution
- Will add troposphere info to allow PPP-RTK through Regional Augmentations
- Will likely take several years to be implemented
- Approach requires access to a net like EUREF's EPN
- Approach requires dense CORS networks from National Mapping Agencies

Summary

An International GNSS Real-Time Service has officially been announced by IGS. The service will begin with a status of Initial Operating Capability (IOC) and give access to globally valid wide-area satellite orbit and clock corrections, which will be capable of supporting sub-decimeter real-time Precise Point Positioning (PPP). As known from a symposium on PPP-RTK & Open Standards earlier this year, RTCM's State Space Representation (SSR) standard develops further towards an alternative to Network RTK. The presentation describes the current situation and outlines possible conclusions emerging for EUREF and its National Mapping Agencies.