



# Session introduction and RT analysis products summary

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# Introduction



Title change from

Real-time Infrastructure and Analysis

To

Real-time Infrastructure, Analysis and  
Applications

New RT PP Slogan

**It's the users, stupid**



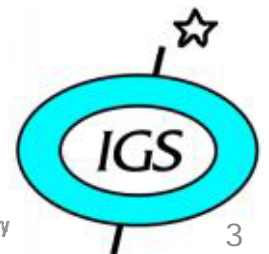
# Introduction



A Real Time  
stream

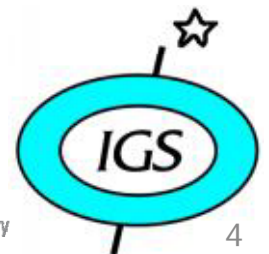
without RT Users

is like p..... in the  
wind



## ❖ Focus on Application Areas and Users:

- RT Infrastructure (and how to use it)
  - Weber
- Disaster Monitoring
  - Blewitt, Ramatchi, Colombo
- Global Weather Modelling
  - Marquardt
- Multi-GNSS and Commercial Services
  - Hauschild, Tegedor
- PPP
  - Takasu, Geng

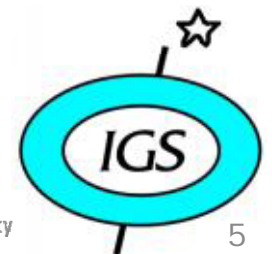


# Session Outline (2)



## ➤ Posters

- GNSS Real Time Services
  - Agrotis(48), Alfaro(49), Dousa2(51), Ge(59), Hauschild(53), Mozo(54), Tegedor(50), Thaler(56), Mireault(35)
- Infrastructure
  - Monico(15), Bruininx(19), Weber(57)
- Disaster Monitoring
  - Chen(58), Colombo(64), Falk(61), Geng(52), Schoene(62,63)
- Geodynamics
  - Zech(60)

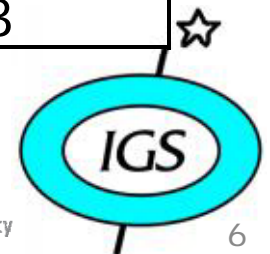


# AC Performance

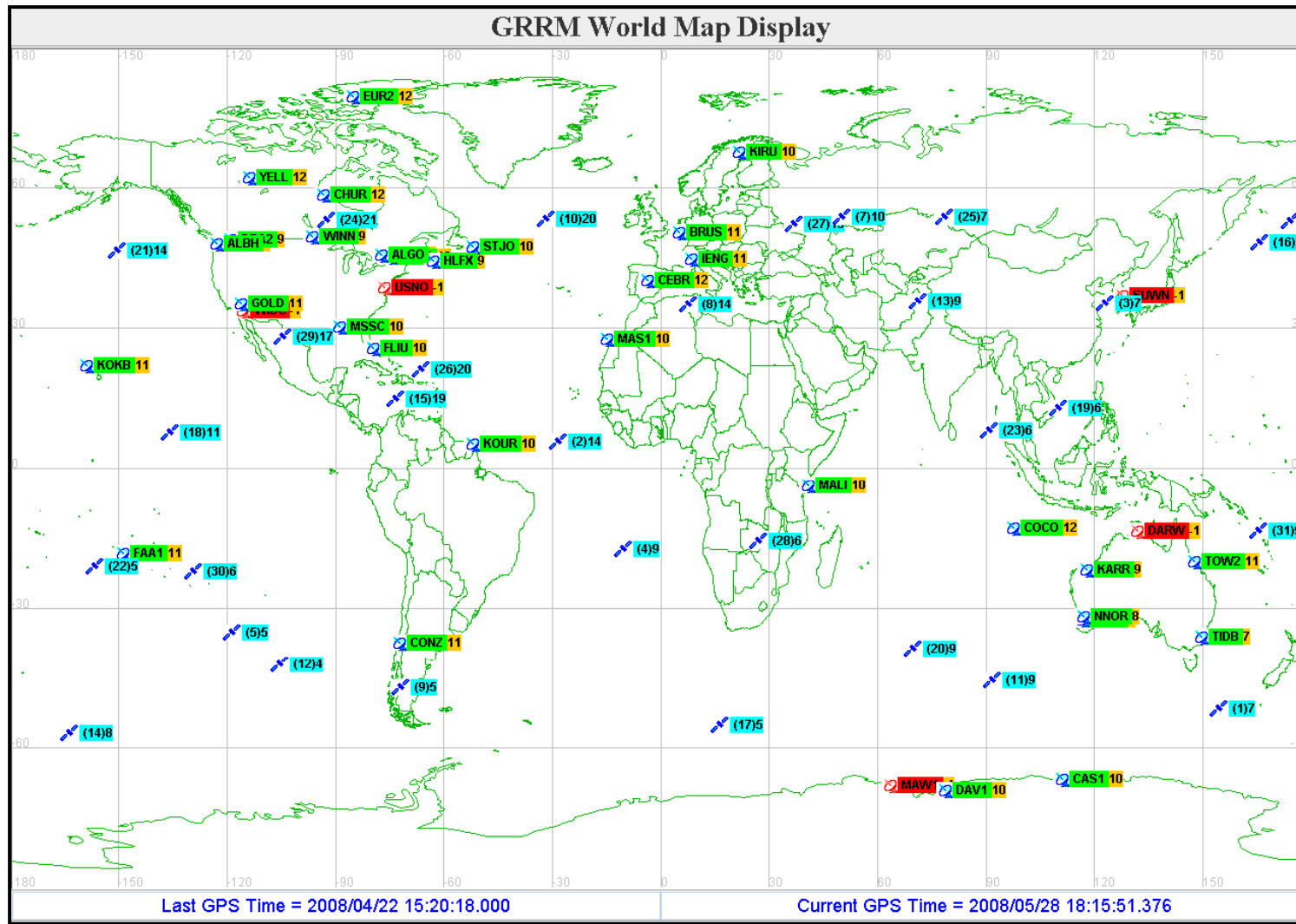


## Snapshots of AC Satellite Clock Results

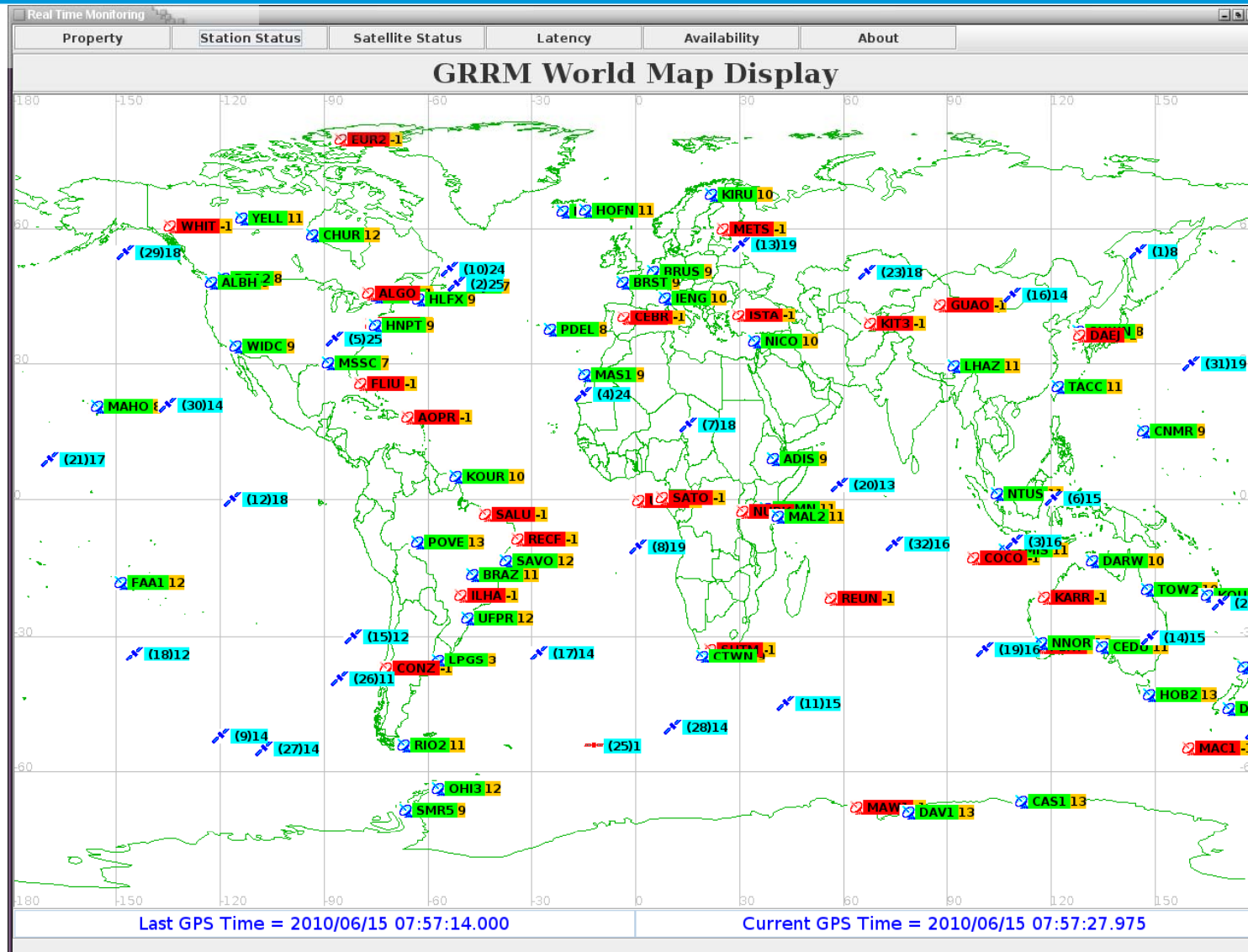
AC	Feb 6 2009		June 8 2010	
	Clock RMS (ns)	Clock Sigma (ns)	Clock RMS (ns)	Clock Sigma (ns)
Comb	0.29	0.22	0.16	0.10
RTComb	-	-	0.15	0.11
BKG	6.72	2.97	0.20	0.12
DLR	0.38	0.10	0.20	0.12
ESOC	0.42	0.38	0.21	0.12
ESOC2	0.36	0.30	0.19	0.11
NRC	0.67	0.62	0.24	0.10
GMV	1.67	1.66	0.28	0.14
TUW			0.70	0.53



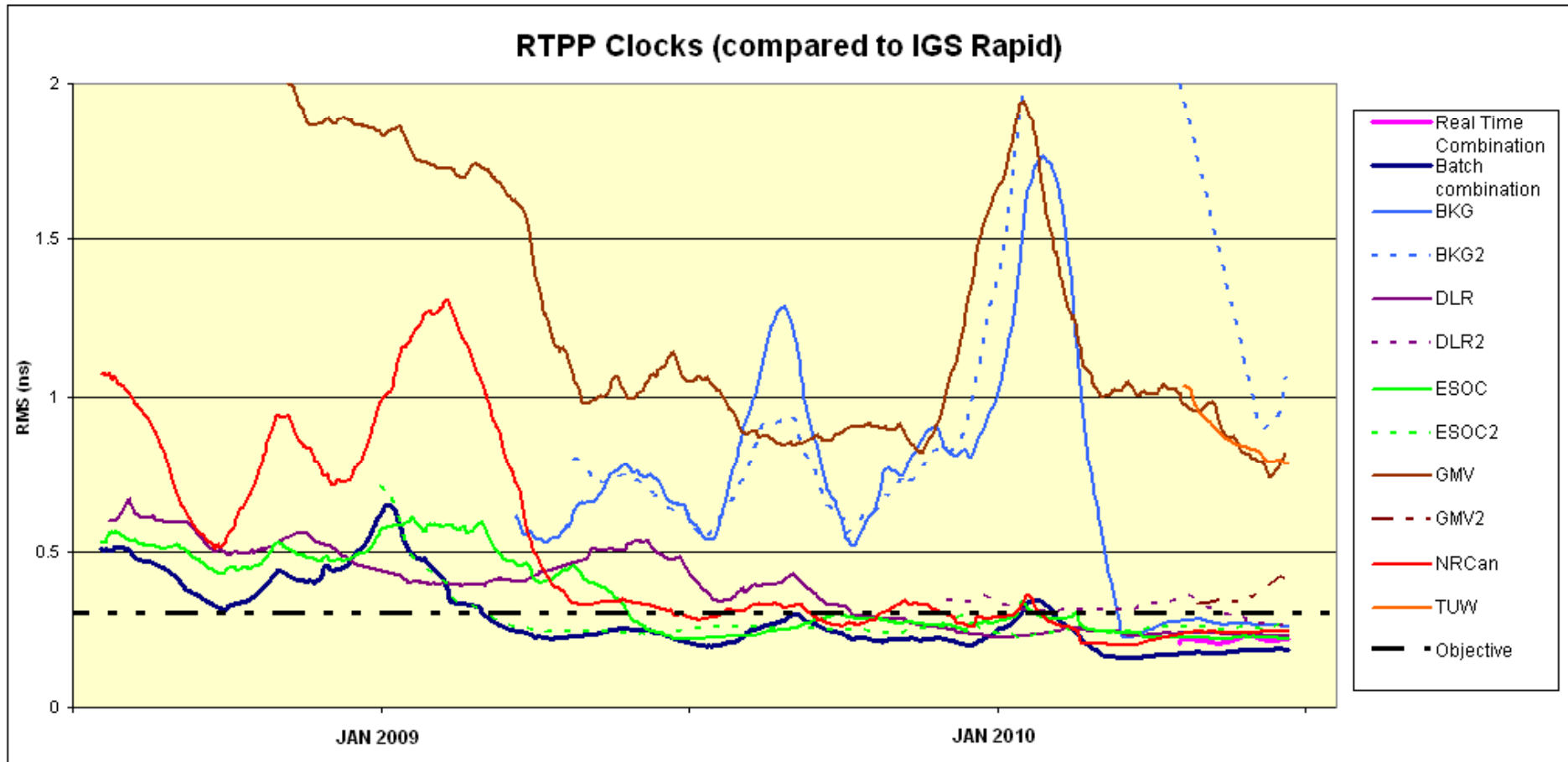
# Tracking Network 2008



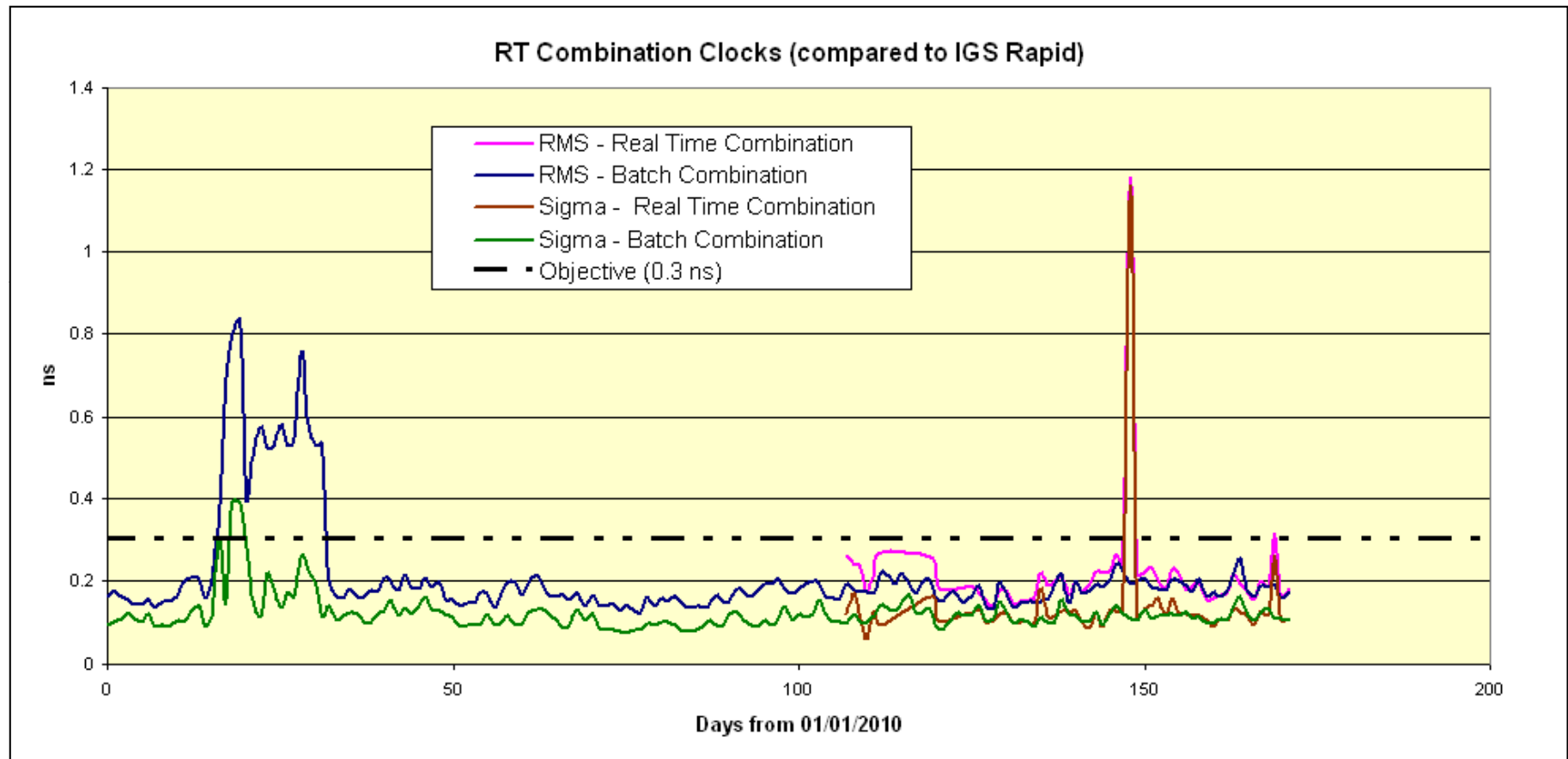
# Tracking Network 2010



# Clock Performance



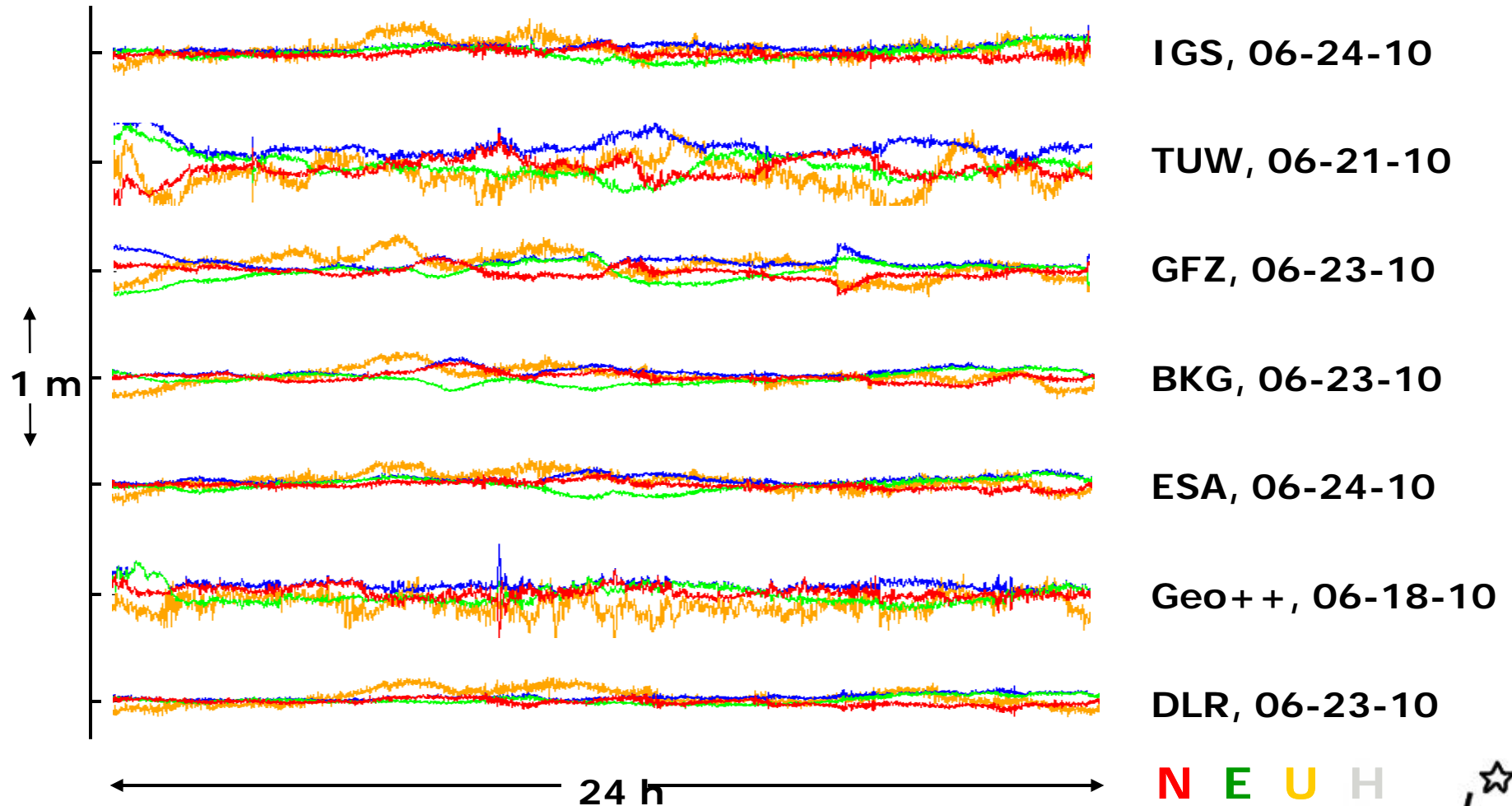
# Combination Solution Performance



➤ Daily results and comparison plots are available at <http://www.rtigs.net/pilot/products.php>



# User Performance



PPP Monitor at <http://igs.bkg.bund.de/ntrip/ppp>



## ❖ Accuracy (compared to IGS Rapids)

- Orbit: 4-6 cm 1-D RMS
- Clock RMS: 0.2 ns
- Clock Sigma: 0.1 ns

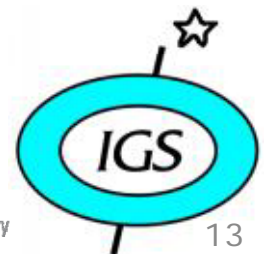
## ❖ Latency

- Latency of Individual Solutions: 7-15 sec
- Latency of Combination: 20 – 30 sec

# Potential Improvements



- ❖ Latency for combination
- ❖ Availability
  - Redundancy in the combination generation and dissemination (Germany+UK)
  - Techniques for users to switch streams
- ❖ Clock Improvements
  - Clock RMS probably approaching the limit. Concentrate on clock sigma improvements
  - Ambiguity fixing techniques
  - Counter problems with ageing GPS satellites (Block IIA)
- ❖ Orbit Improvements
  - Use of ultras vs more frequent orbit updates
- ❖ GLONASS and Galileo Processing
- ❖ Availability of PPP Clients (BKG, RTKLIB)



# Acknowledgements



## ❖ BKG

- Data and product dissemination, RTCM and NTRIP software, PPP client, web site

## ❖ NRCan

- Data dissemination, udpRelay software, RTCM, RT Working Group, PP web site

## ❖ Data providers

- see G. Weber presentation



## ❖ Catch a stream

- Don't waste it in the wind