



# iGMAS Update and Status

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# OUTLINE

**I iGMAS Construction**

**II iGMAS M&A Results**

**III iGMAS Announcement**



# iGMAS Construction



## iGMAS Tasks

Establish global real-time tracking network, which could track the whole orbits of BDS, GPS, GLONASS and Galileo satellites, as well as platform with data collection, storage, analysis, management, publishing abilities. This platform would monitor and assess the GNSS operational status and key indicators, then generate precise ephemeris, Earth Orientation Parameters, station coordinates and speed, global ionospheric delay and GNSS integrity to support satellite navigation technology test, monitoring and assessment, service in scientific research and various applications.

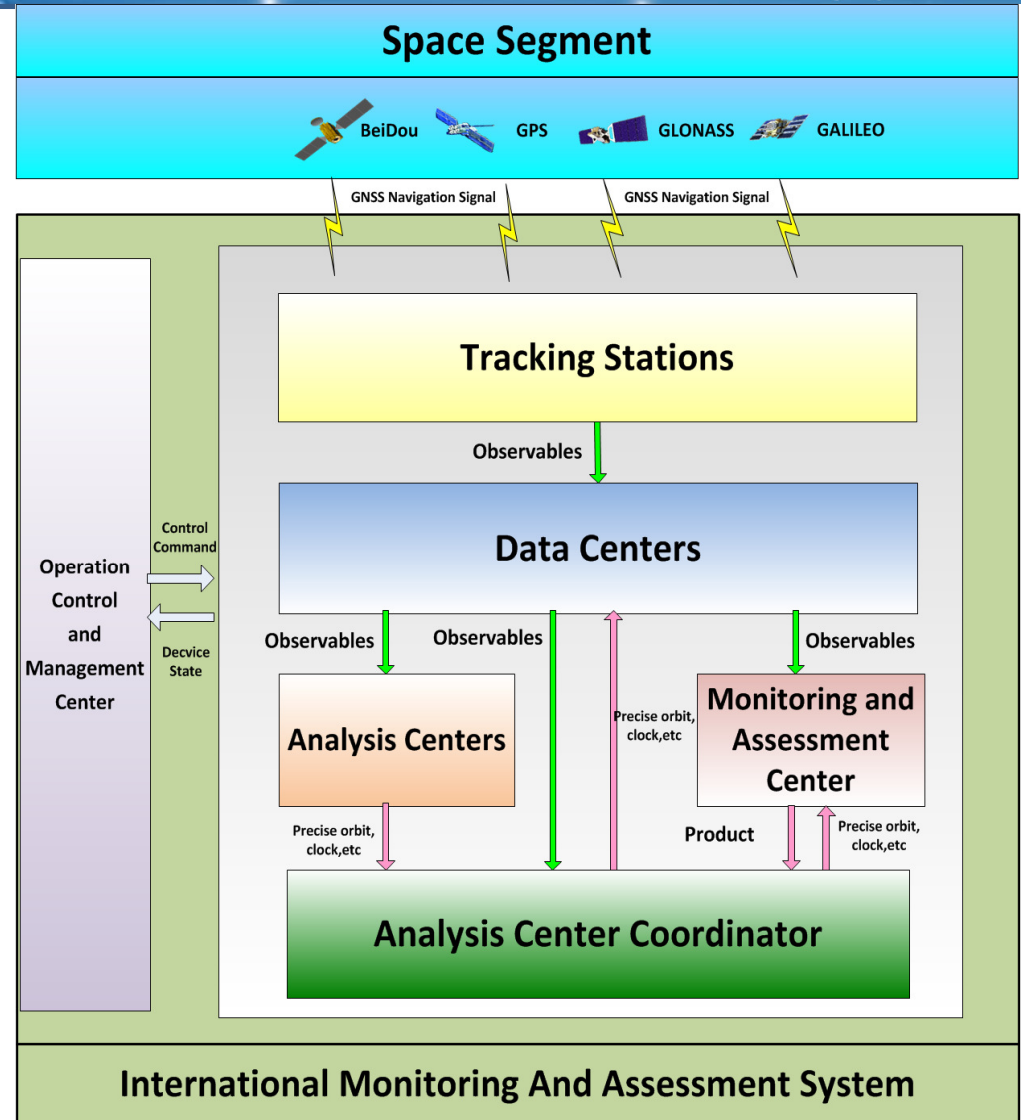


# iGMAS Construction



## System Components

- 30+ tracking stations;
- 4 signal monitoring stations;
- 3 data centers;
- 8 analysis centers;
- 1 monitoring and assessment center;
- 1 product integration and service center;
- 1 operational control and management center.





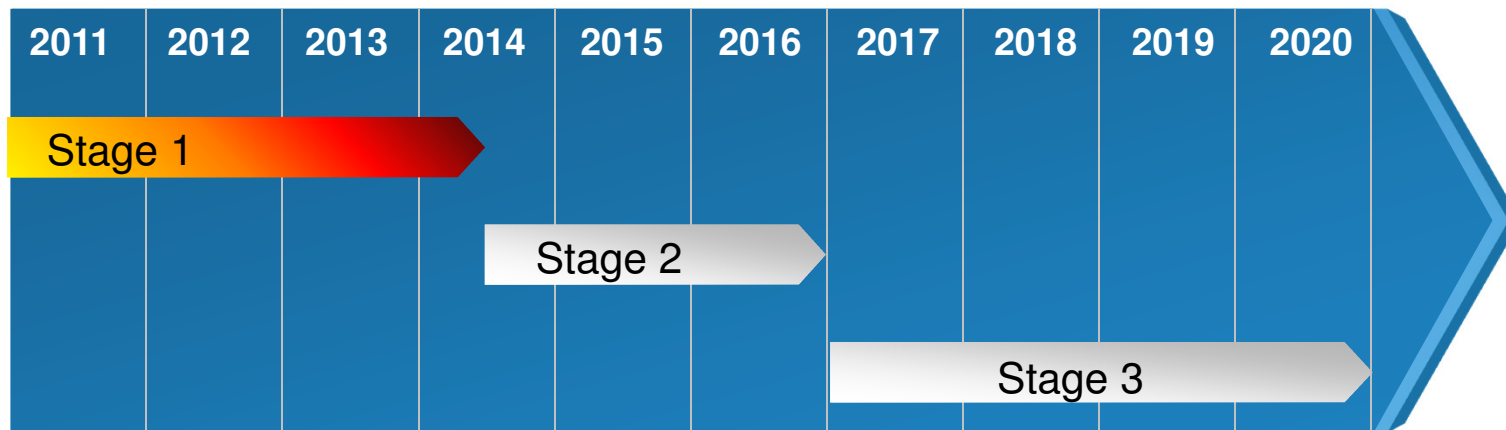


# iGMAS Construction



## Procedure

Stage 1: 2011-2014, built 20 tracking stations, 2 data centers, 5 analysis centers, 1 monitoring and assessment center, 1 product integration and service center, 1 operational control and management center.

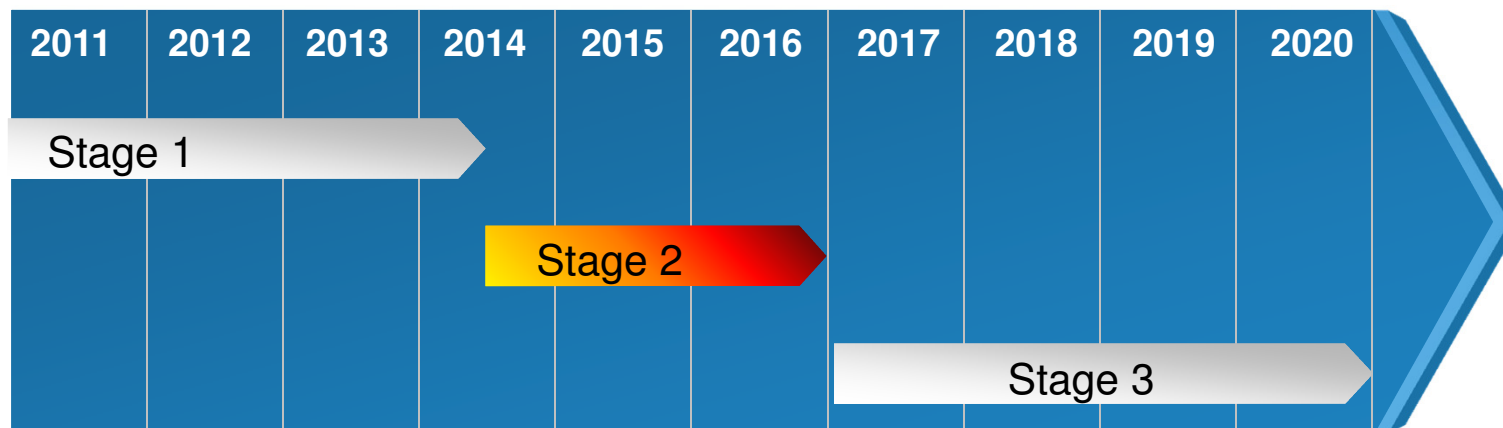




# iGMAS Construction



Stage 2: 2014-2016, build more 10 tracking stations, 1 data center, 2 analysis centers, and update the system for more stations processing ability.

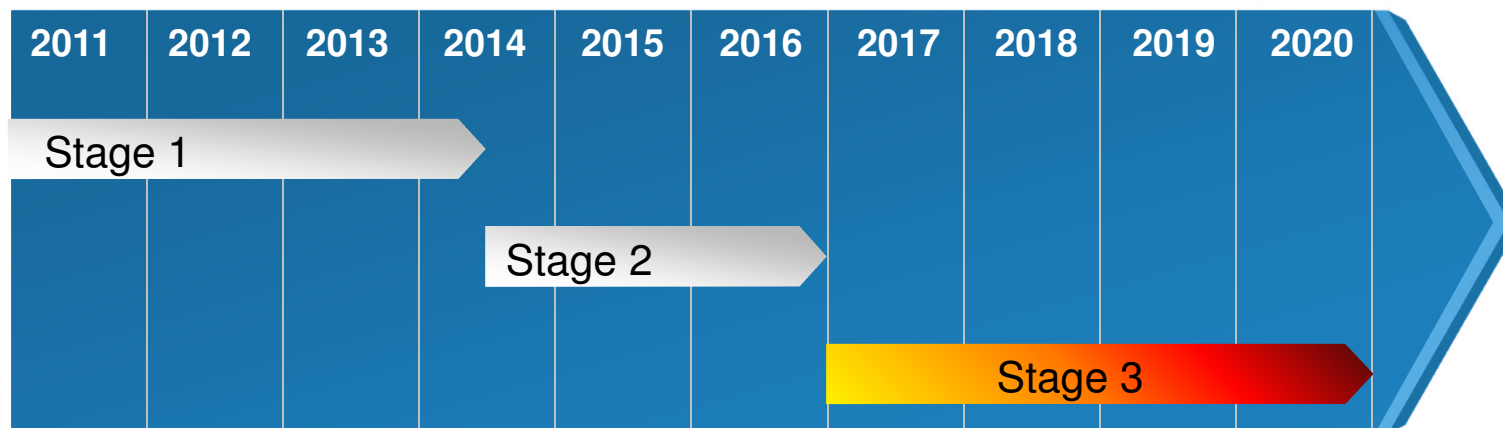




# iGMAS Construction



Stage 3: 2016-2020, update system to have next generation BDS processing ability.





# iGMAS Construction



## Milestones

- Sep. 2007, idea of iGMAS;
- Aug. 2010, requirements analysis and project approachment;
- Mar. 2011, first proposed concept of iGMAS;
- Dec. 2012, iGMAS project approval;
- May 2013, start of iGMAS construction;
- Jan. 2014, start of integration testing;
- Jul. 2014, start of trial running.





# iGMAS Construction



## ✚ GNSS Receiver

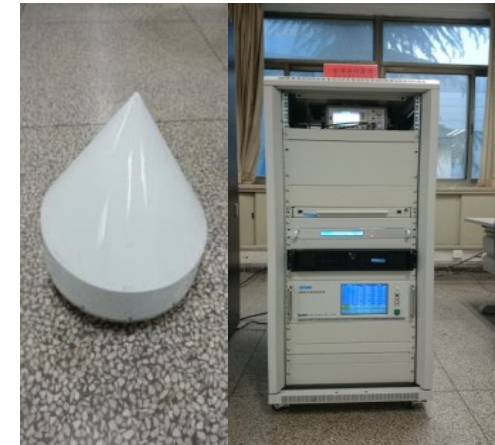
Unicore, CETC 54 and CETC 20 have finished production of multi-GNSS receivers, some of them have been installed on stations.



Unicore



CETC54



CETC20



# iGMAS Construction



## Tracking Stations

- Infrastructure construction of 8 domestic stations have been completed, receiver equipments have been installed.



BeiJing



LASA



Urumqi



Chang Chun



Kun Ming



Shang Hai



Wu Han



Xi'an



# iGMAS Construction



- Arctic and Antarctic stations infrastructure construction have been completed and equipped with receiver and network equipment.
- Several stations outside China, e.g. in Pakistan have been equipped with receiver and network equipment.
- Stations in Russia, Germany, England and South Africa are progressing.





# iGMAS Construction



## ✚ Signal monitoring station

- Apr. 2009, an 7.3m antenna started to work in Xi'an;
- Oct. 2014, an 40m antenna was put into service in Xi'an;
- International cooperation with Canada, Malaysia and Argentina for signal quality monitoring and assessment has been determined.





# iGMAS Construction



## Construction of Centers

- 3 data centers have finished internal integration testing;
- 10 analysis centers have finished internal integration testing;
- Monitoring and assessment center, operational control and management center, product integration and service center have finished internal integration testing;
- iGMAS has started trial running since July,2014.

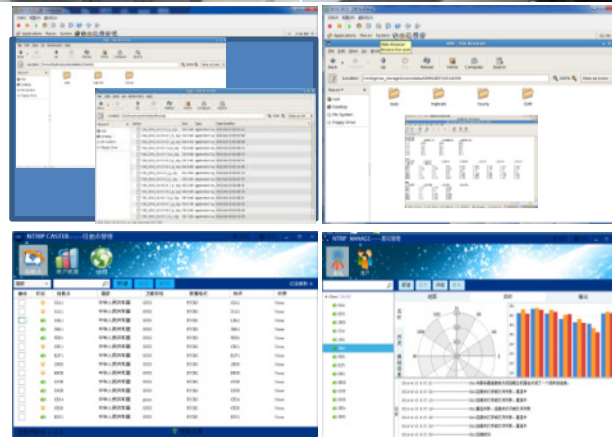




# iGMAS Construction



- Data Center



NUDT



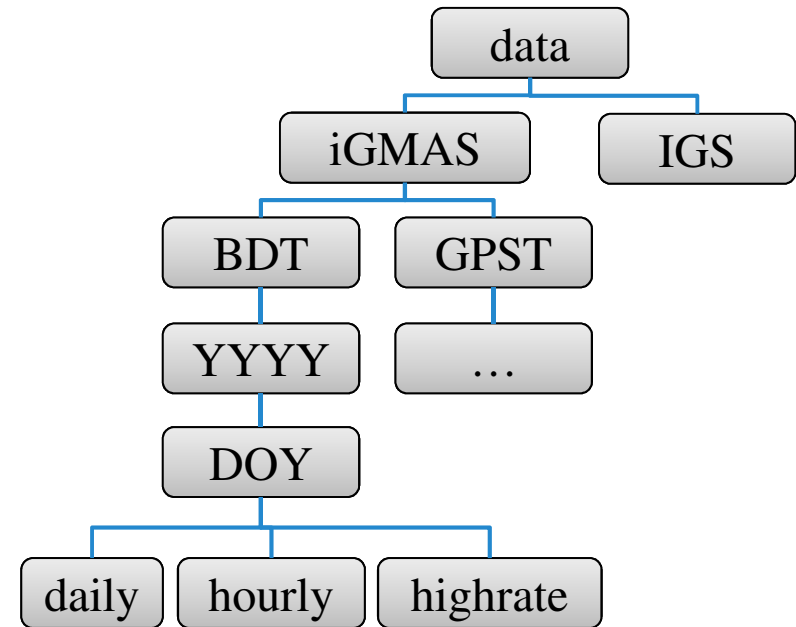
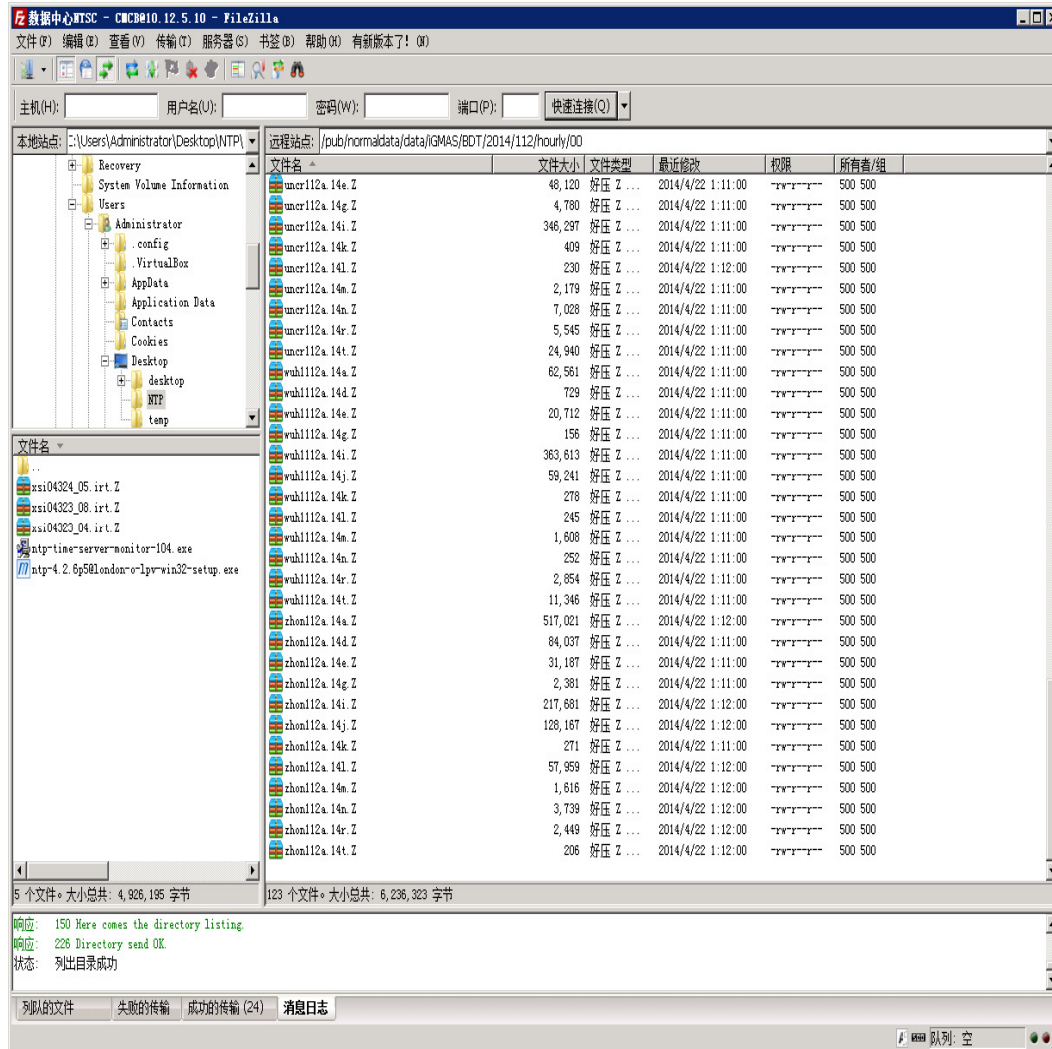
WHU



NTSC



# iGMAS Construction



Data directory



# iGMAS Construction



- Analysis Center



Xi'an Satellite Control Center



Shanghai Astronomical Observatory



Information Engineering University



Chang'an University



Space Information Relay and Transmission Technology Research Center



Beijing Aerospace Control Center



Chinese Academy of Surveying & Mapping



Institute of Geodesy and Geophysics



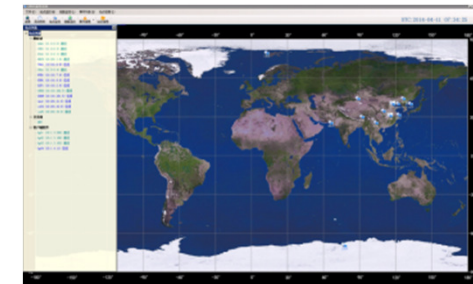
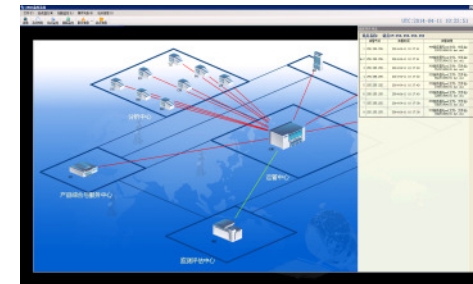




# iGMAS Construction



- Operational Control and Management Center







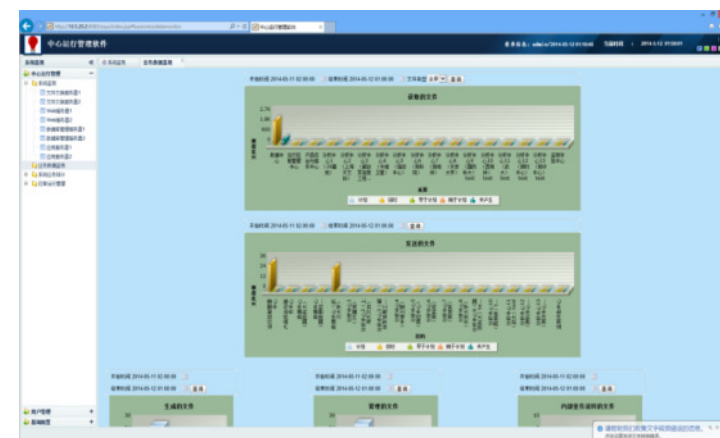
# iGMAS Construction



- Product Integration and Service Center



主键	设备名称	设备型号	设备品牌	设备位置	设备类型	设备状态	设备IP	设备MAC	设备SN
20140511010001	20140511010001	20140511010001	20140511010001	20140511010001	20140511010001	20140511010001	20140511010001	20140511010001	20140511010001
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# OUTLINE

I iGMAS Construction

II iGMAS M&A Results

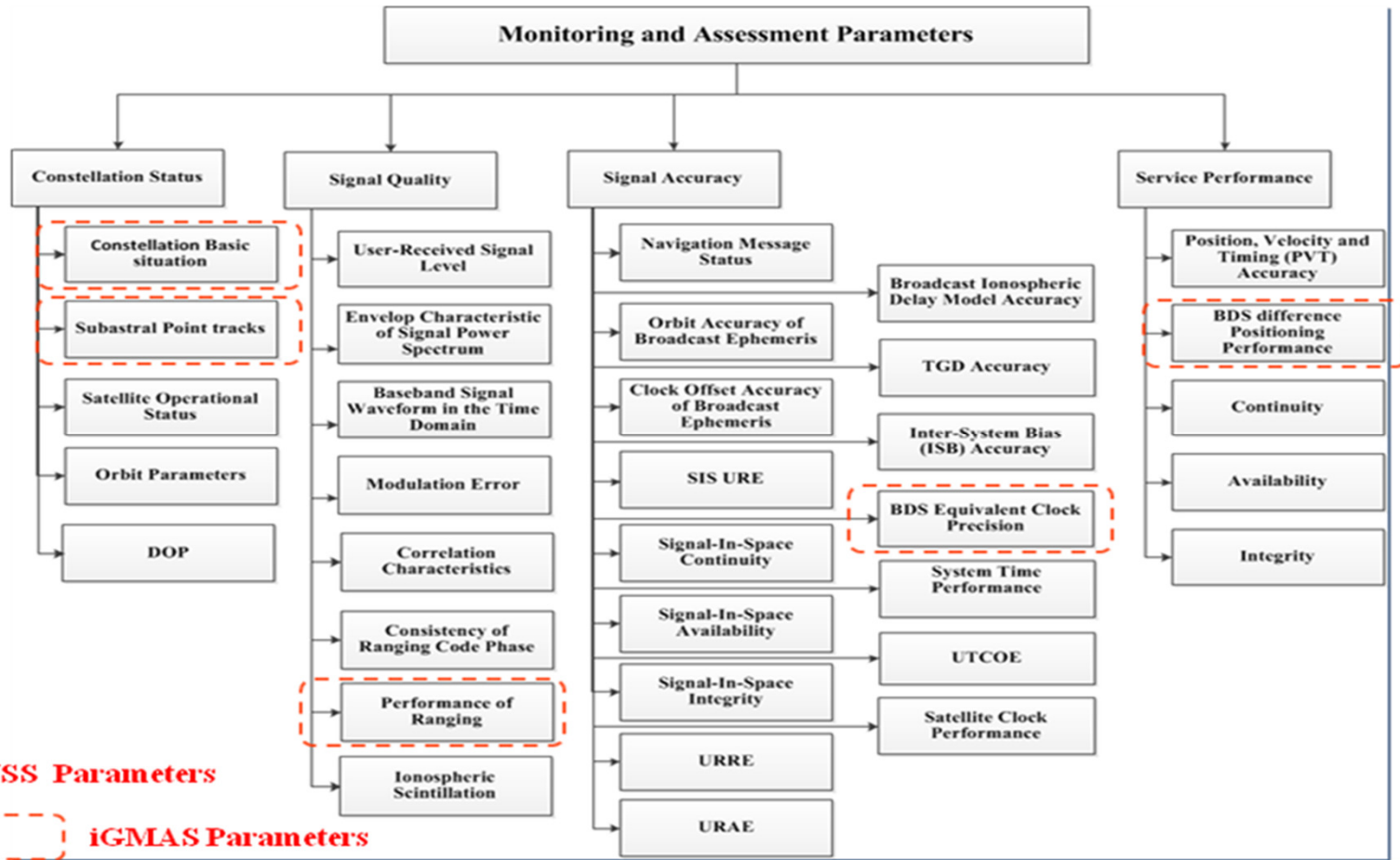
III iGMAS Announcement



# iGMAS M&A Results



## Core Products



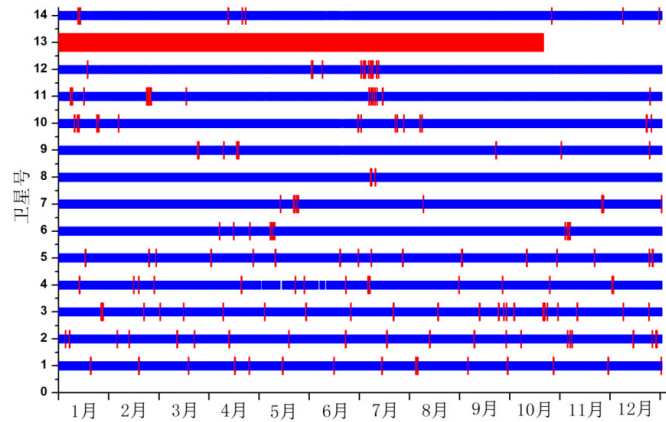




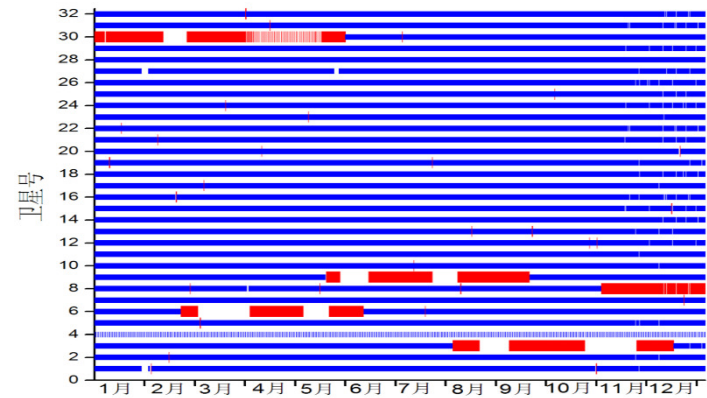
# iGMAS M&A Results



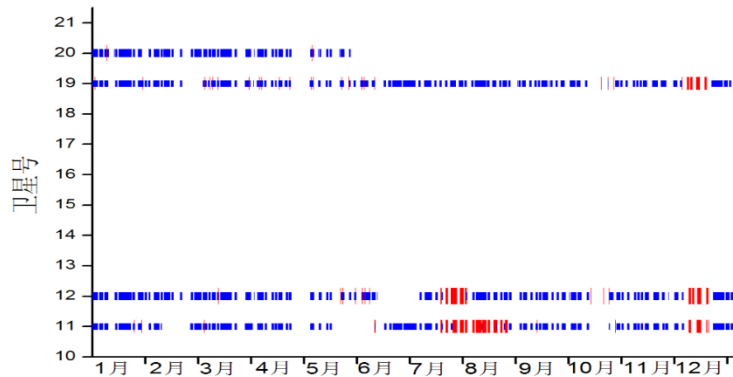
## Constellation Status (2014)



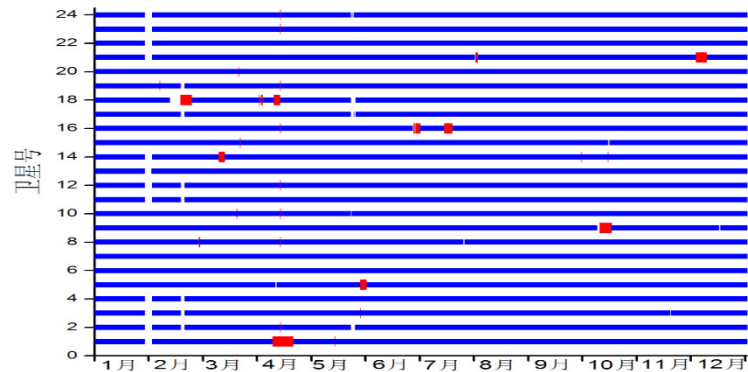
BDS Satellites Availability



GPS Satellites Availability



GALILEO Satellites Availability



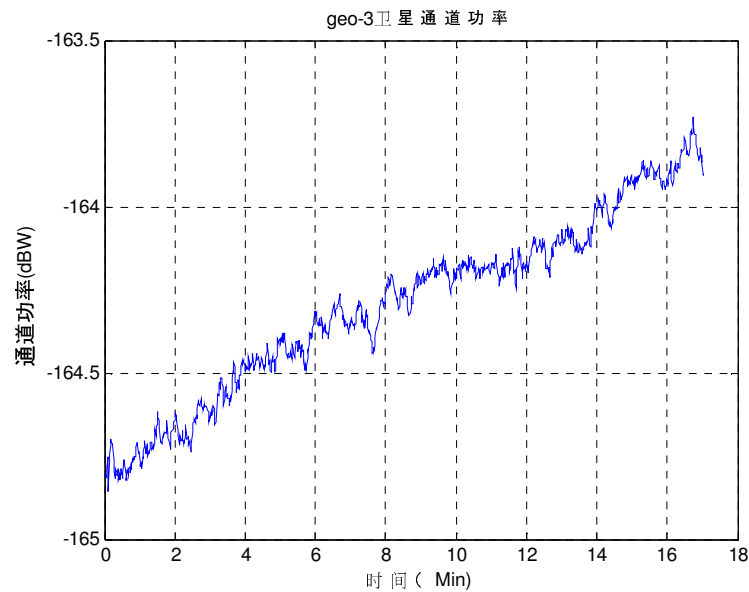
GLONASS Satellites Availability



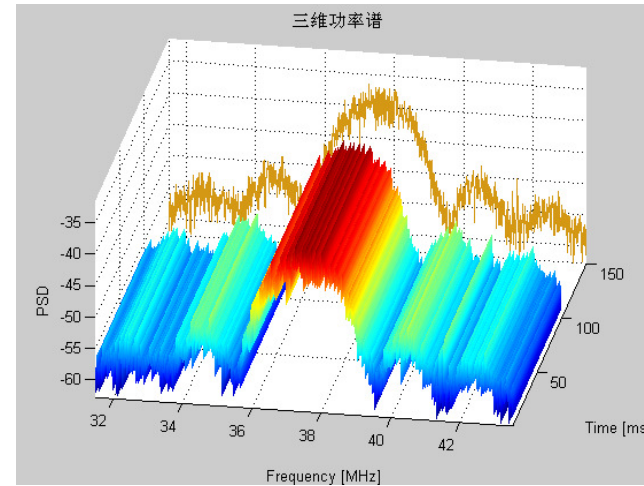
# iGMAS M&A Results



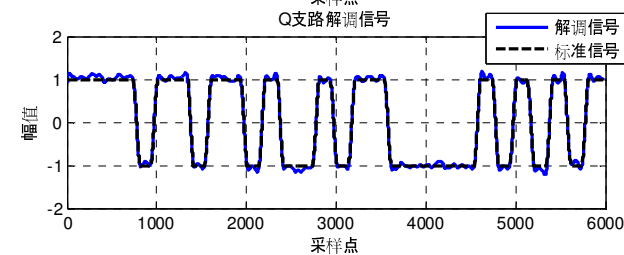
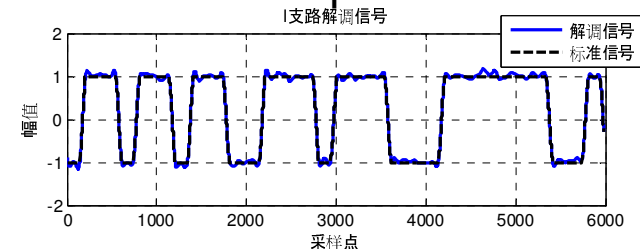
## Quality of Signal-in-space(2014)



User-Received Signal Level



Power Spectrum

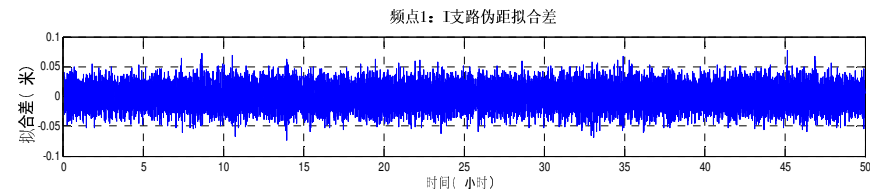
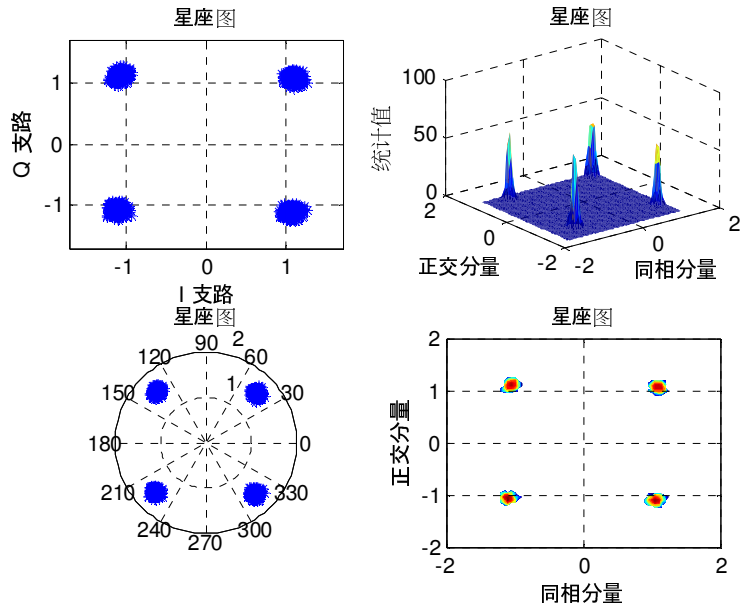


waveform of baseband signal



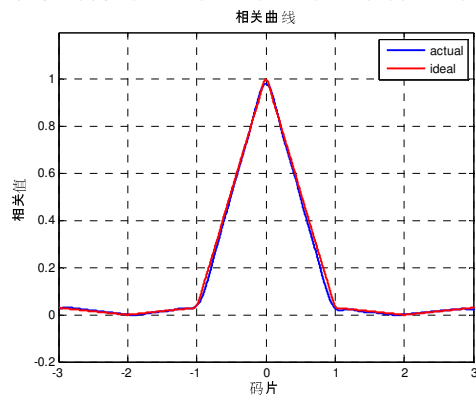


# iGMAS M&A Results

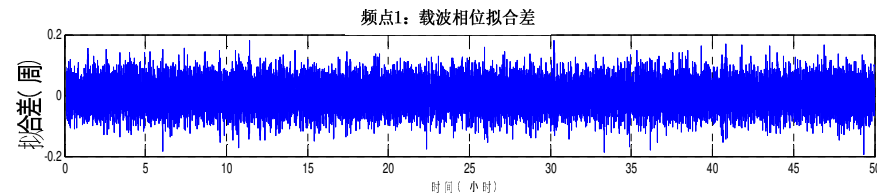


signal ranging value stability

modulation error of carrier phase(April)



signal correlation(August)



Carrier phase value stability

ERROR: undefined  
OFFENDING COMMAND: rest

STACK:

-save[level]-