



Scientific and Technical Subcommittee: 2021
Fifty-eighth session

BeiDou Navigation Satellite System Development

International Cooperation Center of
China Satellite Navigation Office
April 2021



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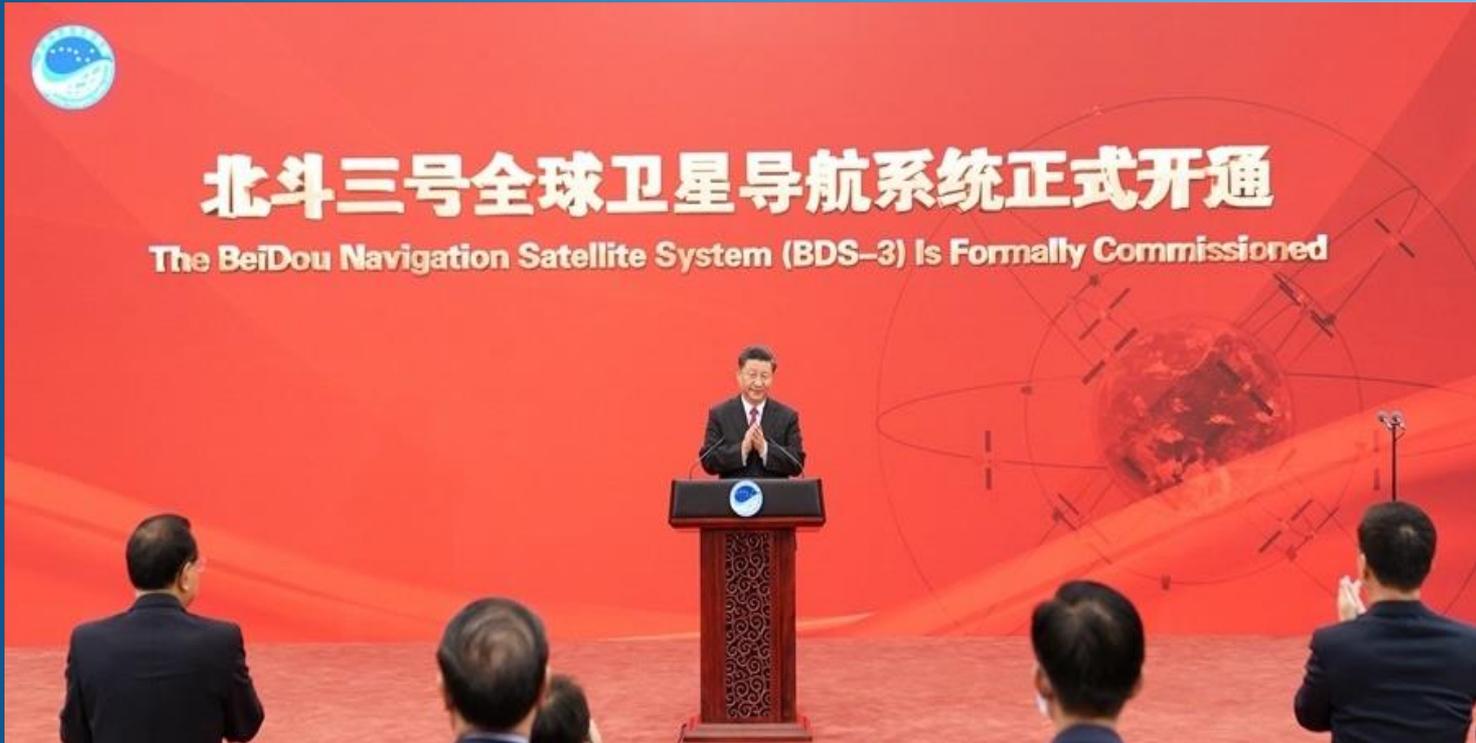


01

System Construction

01 / System Construction

On July 31st, 2020, Chinese President Xi Jinping announced the completion and commissioning of the BeiDou Navigation Satellite System (BDS-3).



01 / System Construction - Services of Seven Types

Global

RNSS

GSMC

SAR

Asia-Pacific
Region

SBAS

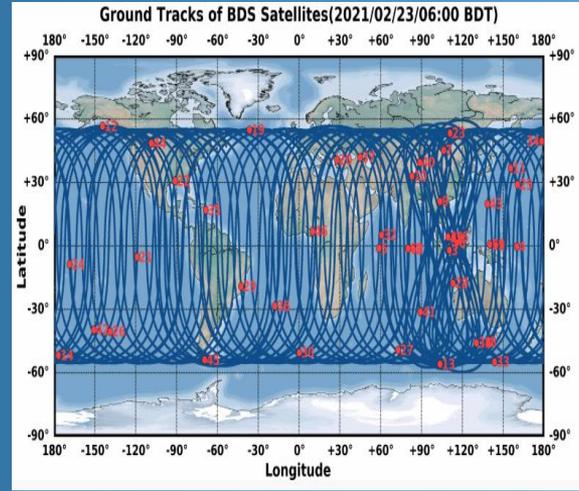
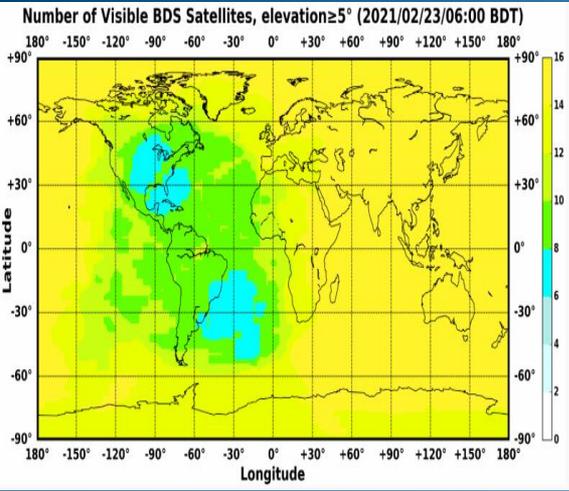
GAS

PPP

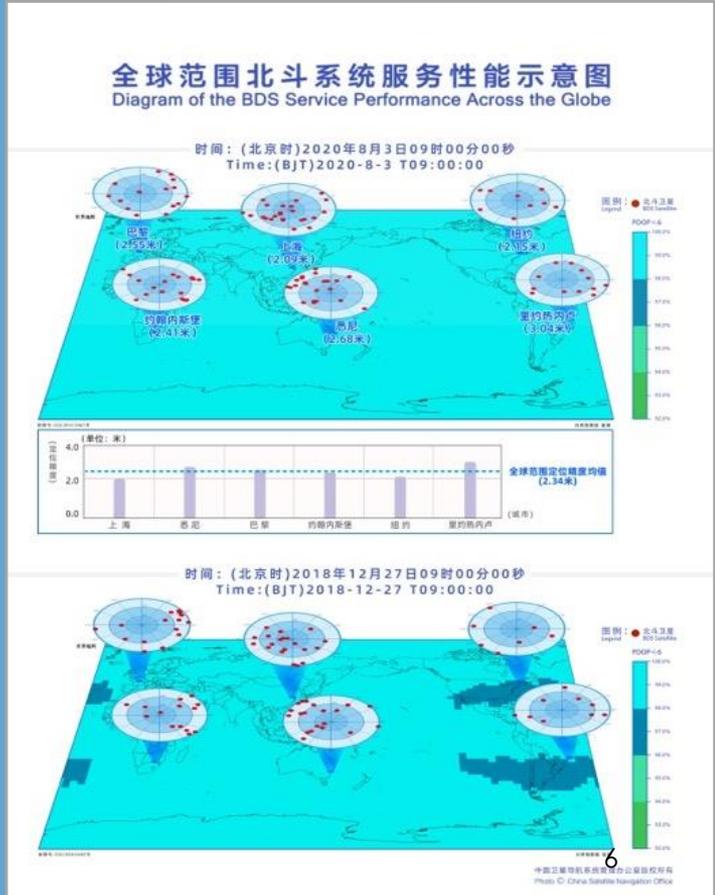
RSMC

01 System Construction

Radio Navigation Satellite Service (RNSS)



- System service coverage: global
- Positioning accuracy: 10 meters horizontally, 10 meters vertically (95%)
- Velocity measurement accuracy: 0.2 m/s (95%)
- Timing accuracy: 20 nanoseconds (95%)
- System service availability: better than 95%

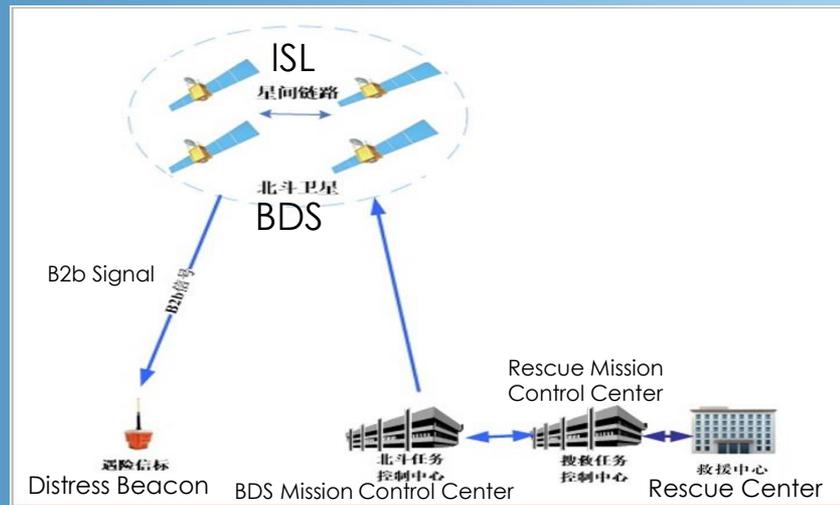
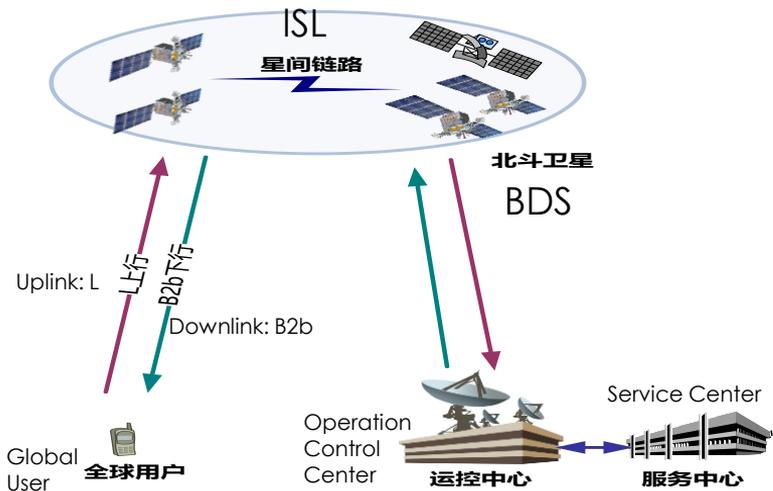


01 System Construction

Services - Global Short Message Communication (GSMC)
- Search and Rescue (SAR)

Global Short Message Communication

- Utilizes 14 MEO satellites
- Supports Global Random Access
- Transmits up to 40 Chinese characters per message

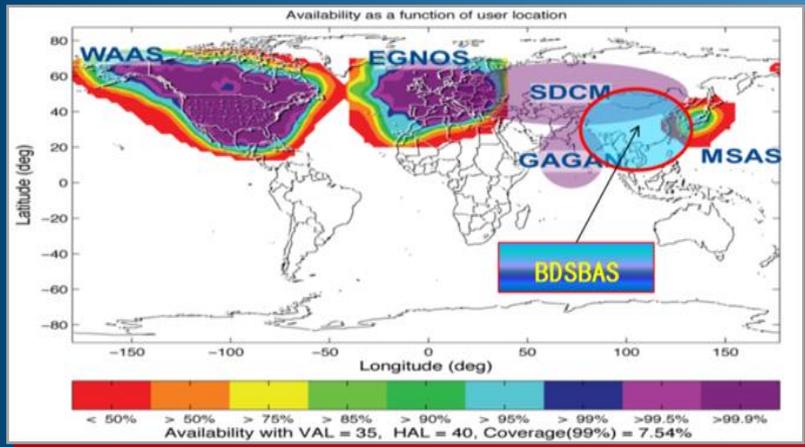


Search and Rescue

- Constructed in accordance with the international standards
- Utilizes 6 MEO satellites with SAR payloads
- Supports return links

01 System Construction

Services - Satellite-Based Augmentation System (SBAS)
- Ground Augmentation System (GAS)



Satellite-Based Augmentation System

- Utilizes 3 GEO satellites
- Conforms to ICAO standards
- Covers China and surrounding areas
- Supports single frequency and dual frequency multi-constellation formats

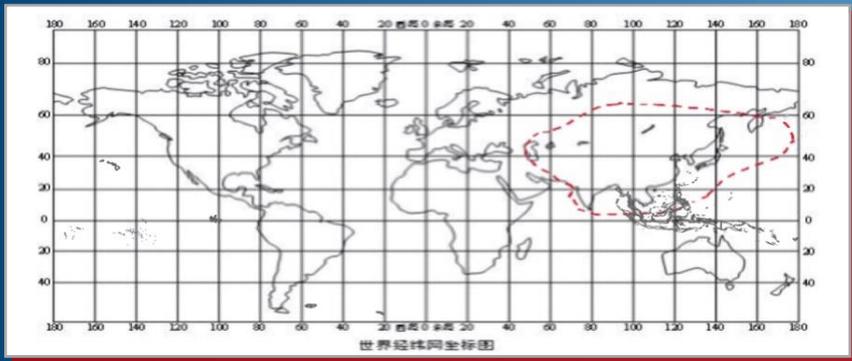
Ground Augmentation System

- Utilizes mobile communication networks or the Internet
- Provides users with high-precision positioning services at the meter, decimeter, centimeter and millimeter levels



01 System Construction

Services - Regional Short Message Communication (RSMC)
- Precise Point Positioning (PPP)

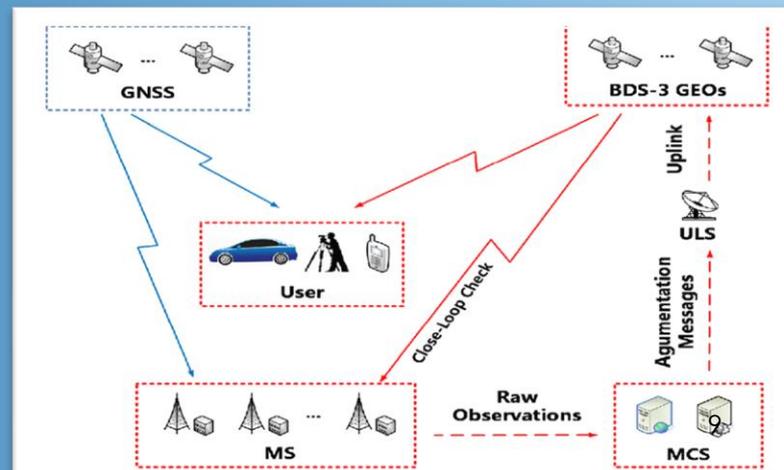


Regional Short Message Communication

- Utilizes 3 GEO satellites
- Covers China and surrounding areas
- System capacity enhanced by 10 times

Precise Point Positioning

- Utilizes 3 GEO satellites
- Covers China and surrounding areas
- Achieves decimeter-level (dynamic) and centimeter-level (static)



01 System Construction

Information Dissemination

- The latest released documents of Open Service Performance Standard, Signal In Space Interface Control Document, System Time, and Reference Frame Template are shown as followings.
- More information is available at: en.beidou.gov.cn



Document	Date
BeiDou Navigation Satellite System Signal In Space Interface Control Document Open Service Signal B2b (Version 1.0)	2020.08
BeiDou Navigation Satellite System Signal In Space Interface Control Document Precise Point Positioning Service Signal PPP-B2b (Version 1.0)	2020.08
BeiDou Navigation Satellite System Signal In Space Interface Control Document Satellite Based Augmentation System Service Signal BDSBAS-B1C (Version 1.0)	2020.08
BeiDou Navigation Satellite System Signal In Space Interface Control Document Search and Rescue Service (Version 1.0)	2020.08
Satellite Antenna Phase Center of BDS	2019.12
Satellite Information of BDS	2019.12
Development of the BeiDou Navigation Satellite System (Version 4.0)	2019.12



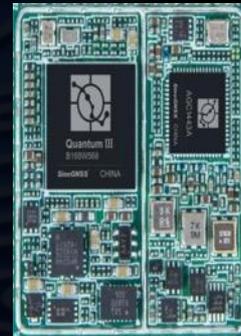
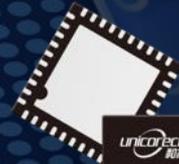
02

Application Promotion

02 / Application Promotion

Fundamental Products

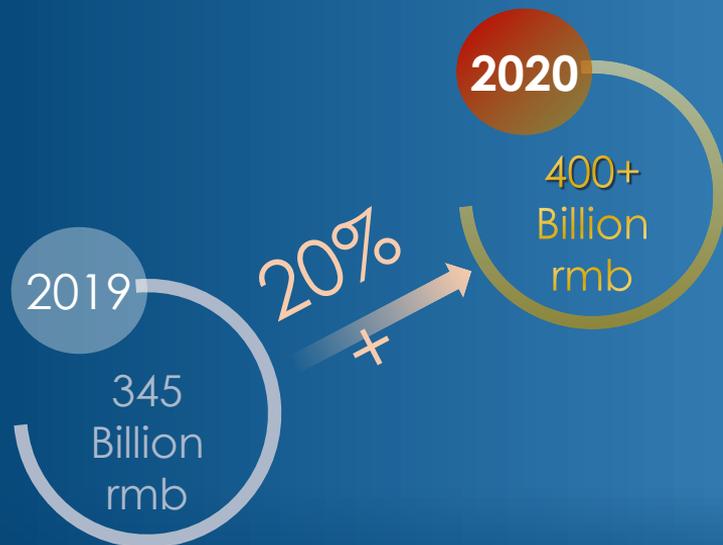
A complete industrial chain integrating chips, modules, boards, terminals, operations and services has been built.



02 / Application Promotion

BDS-related Industries

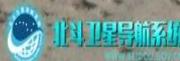
Industrial output value of the satellite navigation and positioning services:



02 / Application Promotion

BDS-related Industries

BDS smart camel husbandry



BDS-based agricultural machinery unmanned driving



BDS-based fishing vessel navigation



BDS crop fertilization



BDS economic and social benefits in the agriculture, forestry, fishery, public security, power supply, disaster prevention and mitigation, and infrastructure construction industries.

02 / Application Promotion

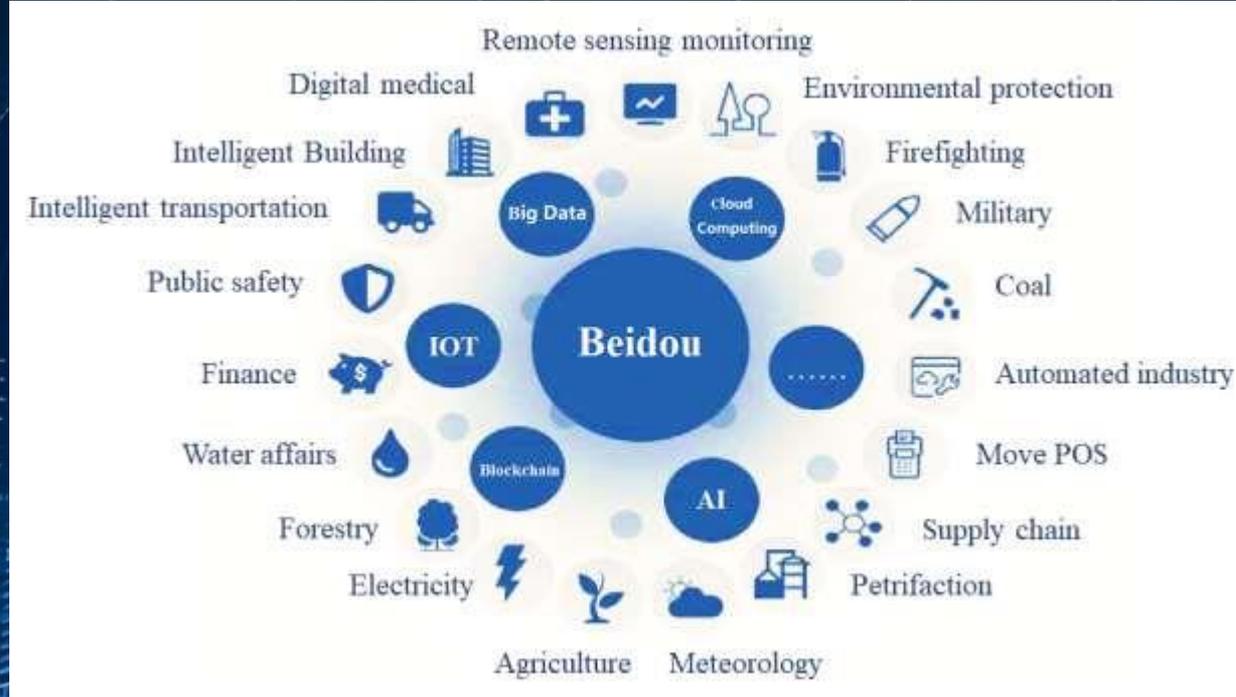
BDS-related Industries



02 Application Promotion

Innovative Applications

Telemetry
Environmental Protection
Fire Fighting
Military applications
Coal
Industrial Automation
Mobile POS
Supply Chain
Petrochemical Industry
Meteorology
Agriculture
Electricity
Forestry
Water Affairs
Finance
Public Security
Intelligent Transportation
Intelligent Building
Digital Healthcare



Artificial Intelligence
Blockchain
Internet of Things
Big Data
Cloud Computation

02 / Application Promotion

International Applications

- Land rights determination
- Precision agriculture
- Digital construction
- Regulation upon vehicles and vessels
- Intelligent port management





03

International Cooperation

03 / International Cooperation

Bilateral Cooperation

China - Russia

The 6th and 7th Meeting of the China-Russia Satellite Navigation Key Strategic Cooperation Project Committee

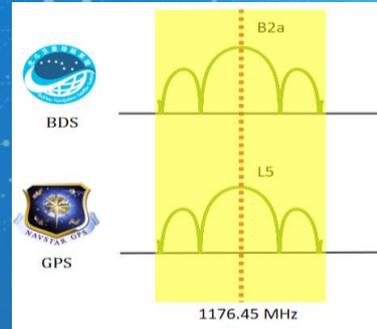


03 / International Cooperation

Bilateral Cooperation

China - US

Interoperability Coordination



China-European

In terms of China-European bilateral cooperation, both parties have actively accelerated the progress of compatibility and interoperability between the two systems.



03 / International Cooperation

Multilateral Cooperation

Participating international cooperation committees as ICG, STSC, and COPUOS, promoting peaceful use and exploration of space.



03 / International Cooperation

Multilateral Cooperation



The 2nd China-Arab States BDS Cooperation Forum



The 3rd China-ASEAN BDS Application and Industries Development and Cooperation Forum



International Committee on Global Navigation Satellite Systems (ICG)-14



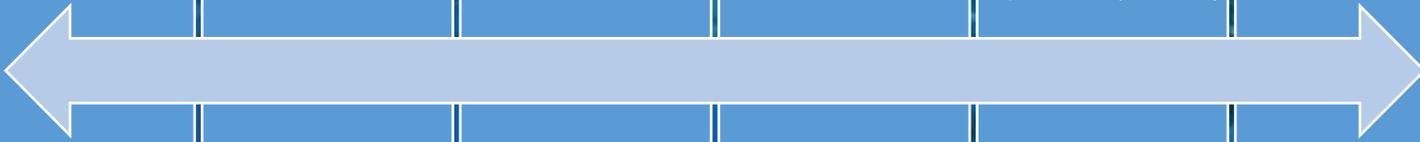
2020 International Training Workshop on BDS Technology and Applications in Countries along the Belt and Road



Virtue Signing Ceremony of Memorandum of Understanding between China Satellite Navigation Office and Comisión Nacional de Actividades Espaciales (CONAE)



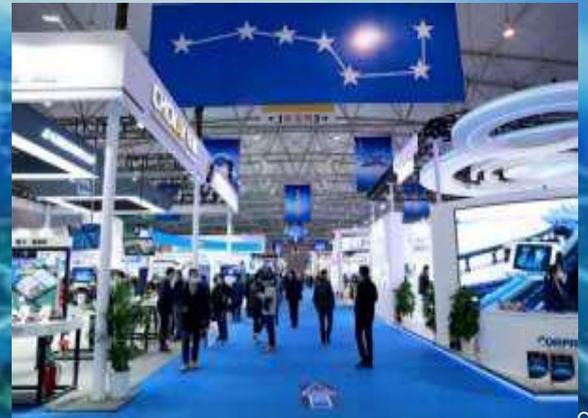
The 7th China-Central Asia Cooperation Forum



03 / International Cooperation

Multilateral Cooperation

In 2021, the 12th China Satellite Navigation Conference is to be held from May 26 to 28 at NanChang Greenland International Expo Center, highlighting the role of spatiotemporal data. Welcome participation to exchange ideas on frontier topics and explore breakthroughs in industrial applications.



03 / International Cooperation

Development of International Standards



03 / International Cooperation

Development of International Standards



International
Electrotechnical
Commission



COSPAS-SARSAT.INT
INTERNATIONAL SATELLITE SYSTEM FOR SEARCH AND RESCUE
406TH DISTRESS ALERTING SERVICE



BDS Future Development

1

Focus



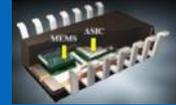
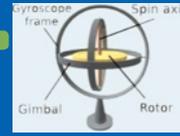
Satellite Navigation System



Communication



Inertial Navigation System



2

Fusion

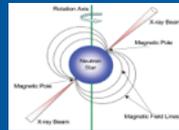


3

Innovation



Hydro-acoustic positioning



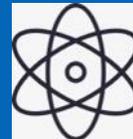
Pulsar



Random Signal



Micro-PNT



Quantum



AI



Thanks for Your Continuous Attention and
Support to the BDS Development

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