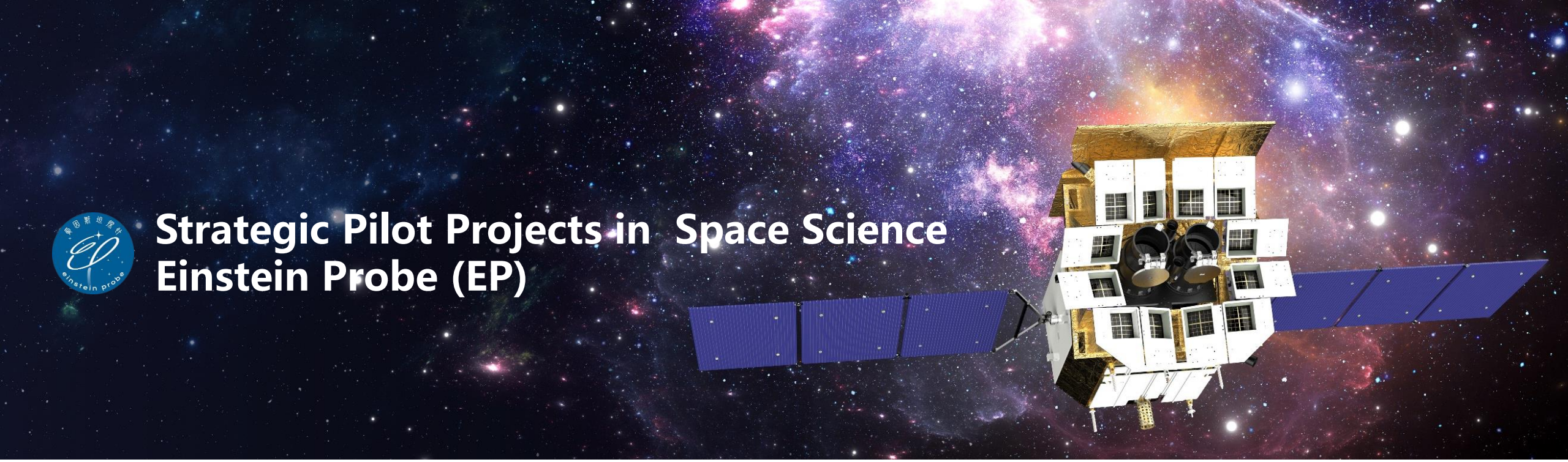

X band data telemetry and cooperation with ESOC

JU SU

2024.04.24

NSSC 中国科学院国家空间科学中心
National Space Science Center, CAS

目录

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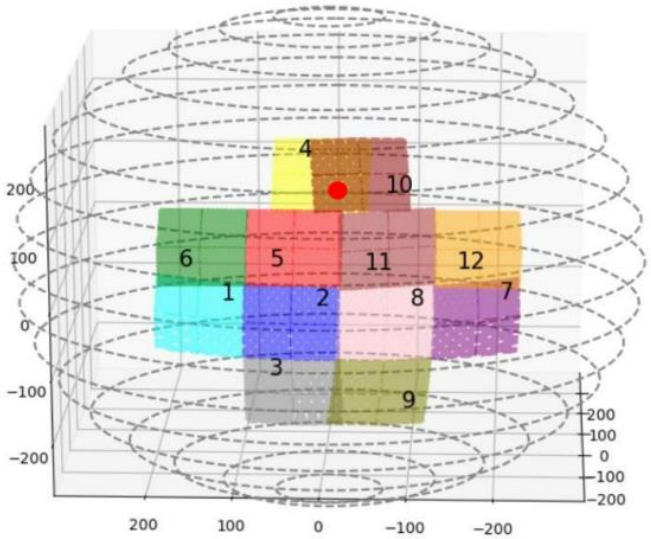
Overall introduction

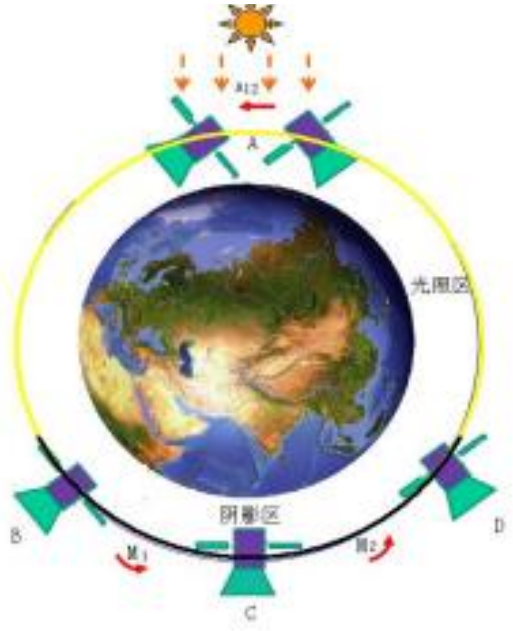
- Observation Type
  - GP— General Pointing
  - ToO— Target of Opportunity



Data generate rate

Payload	GP	ToO
FXT	21Gbits/day	92Gbits/day
WXT	40.5Gbits/day	40.5Gbits/day

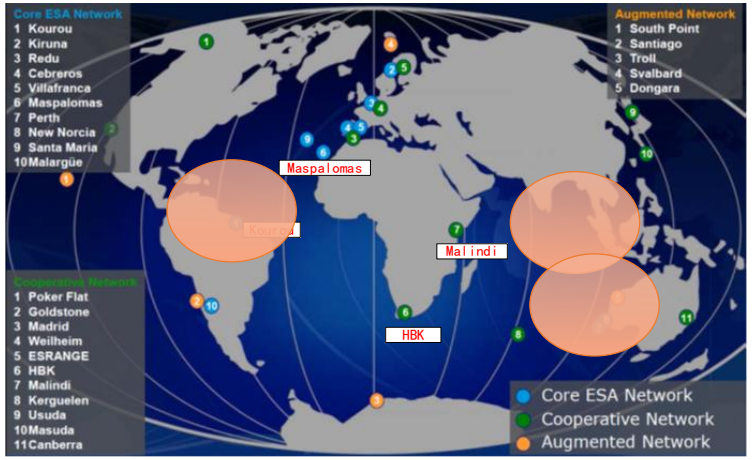
Total data per day < 132.5Gbits.



X band reception requirement

- In order to obtain observation data as soon as possible, the X-band data receiving times should be increased as much as possible and the data acquisition delay should be shortened.
- Each receiving pass downlink the observed data onboard completely .
- Through the cooperation between the Chinese and European ground stations, the visibility of the reception can be improved, and data reception can be completed timely.

Sanya station



Kourou, Western Australia and Singapore station

NSSC-ESOC cooperation

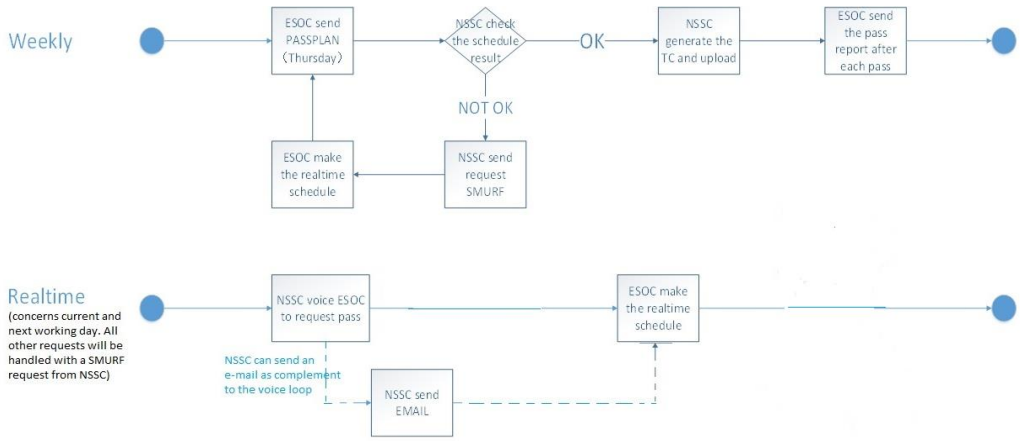
Ground station scheduled strategy

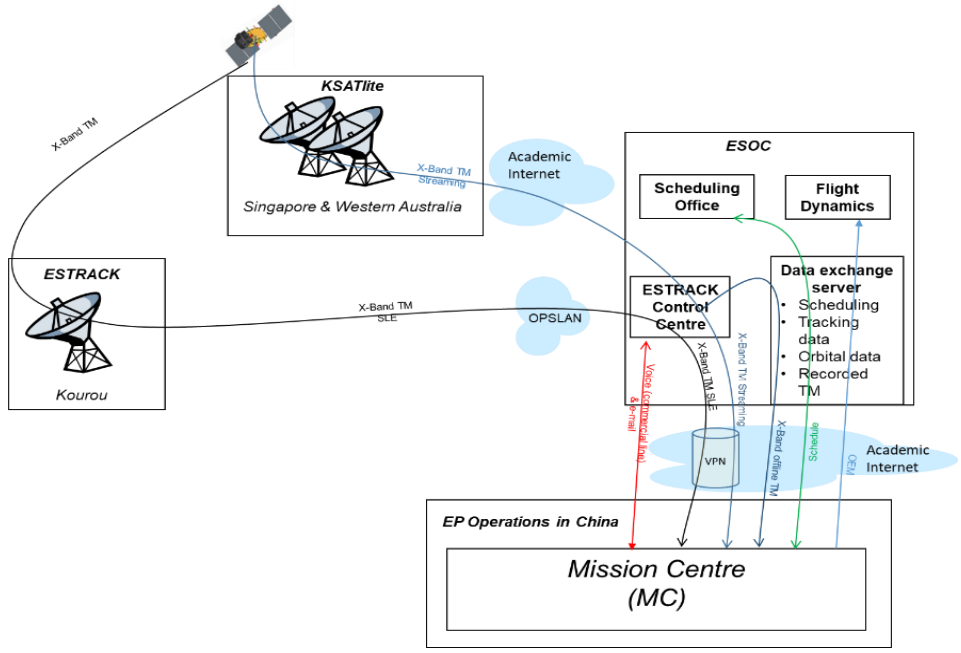
- Sanya station scheduled 4 passes per day (> 3min visibility).
- The ground stations of the ESA scheduled 6-8 passes per day in the invisible laps of the Sanya station.

NSSC-ESOC cooperation

Operation process

- ESOC strategically schedule the passplan of the European ground station next week and provided to NSSC on Thursday.
- NSSC combines the passplan of Sanya Station, generates TCs, and uploads them to the satellite
- ESOC received the download TM data and transmit to NSSC.

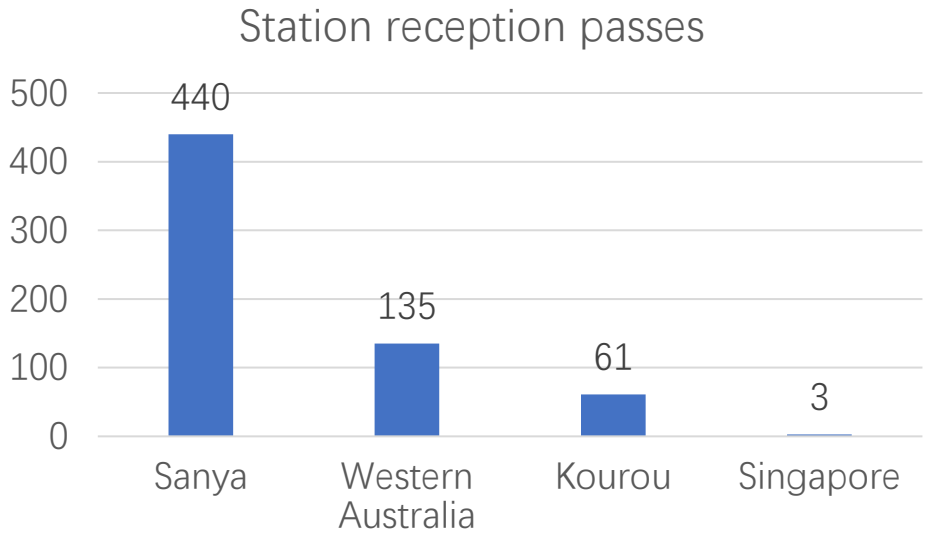


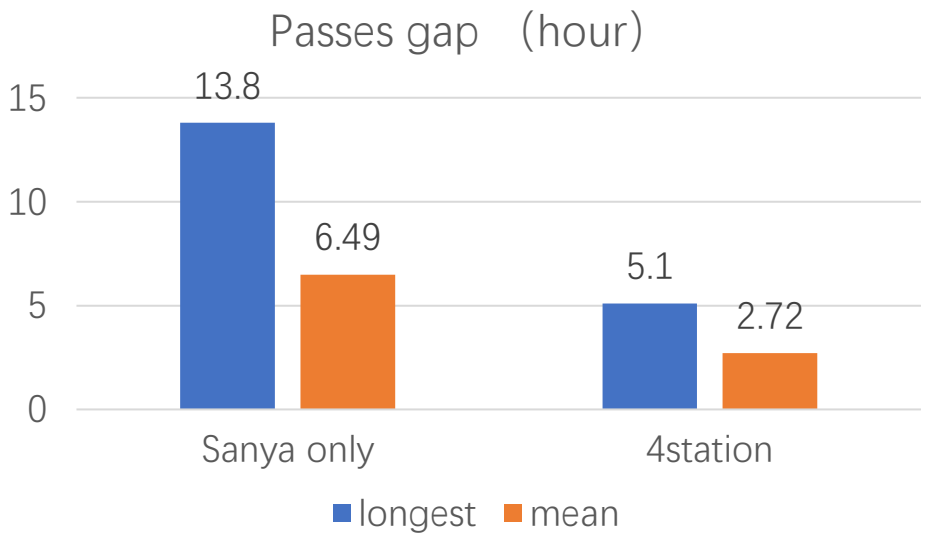


NO.	source	destination	interface	protocol
1	ESOC	NSSC	TM	SLE（Kourou） TCP/sFTP（KSAT）
2			passplan	sFTP
3	NSSC	ESOC	Orbit	sFTP
4			request	sFTP

requirement satisfaction analysis

- Scheduled passes：~10 passes/day
  - Sanya 4 + ESOC 6
- Data reception passes：639 （4 stations）
- Reception gap：
  - Longest：13.8h→5.12h
  - Mean: 6.49h→2.72h

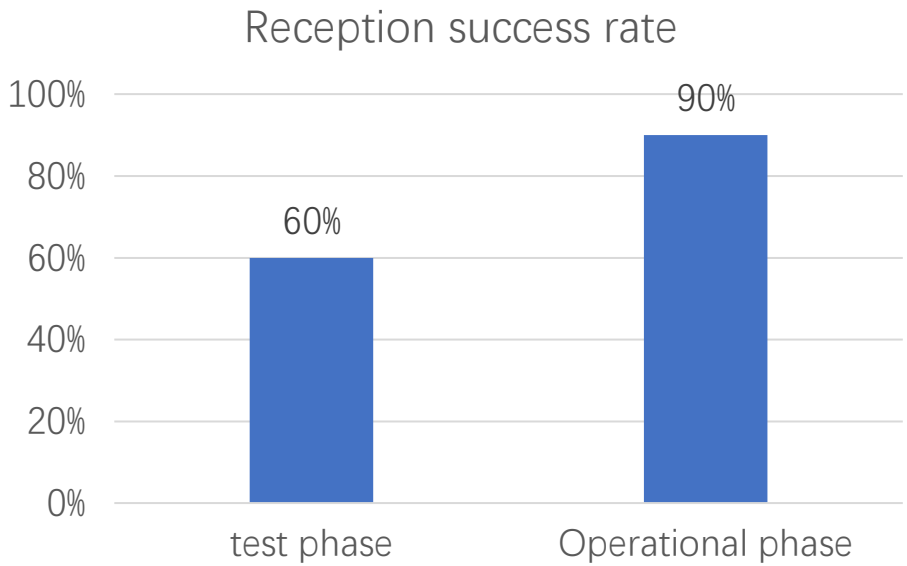




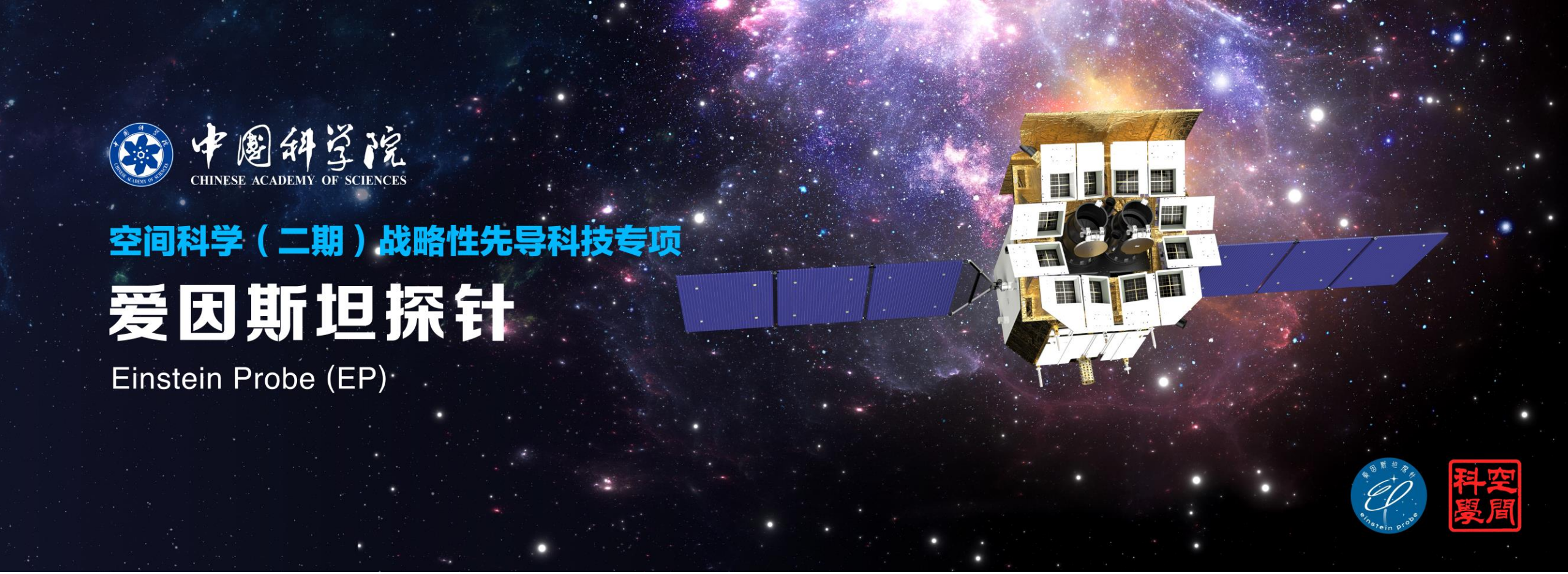
Data reception test status

Kourou, Western Australia & Singapore station

- On January 29, 2024, the European ground station began to reception tests.
- Since March 19, all stations in routine operation mode.



- Test status: **all problem resolved**
  - ✓ The board - ground demodulation system does not match。
  - ✓ The downlink data frame is incorrect, and some data is missing in the processing results.
  - ✓ sFTP file transfer delay is large.(10h→30min)
  - ✓ Data transmission is interrupted through SLE.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Thank you