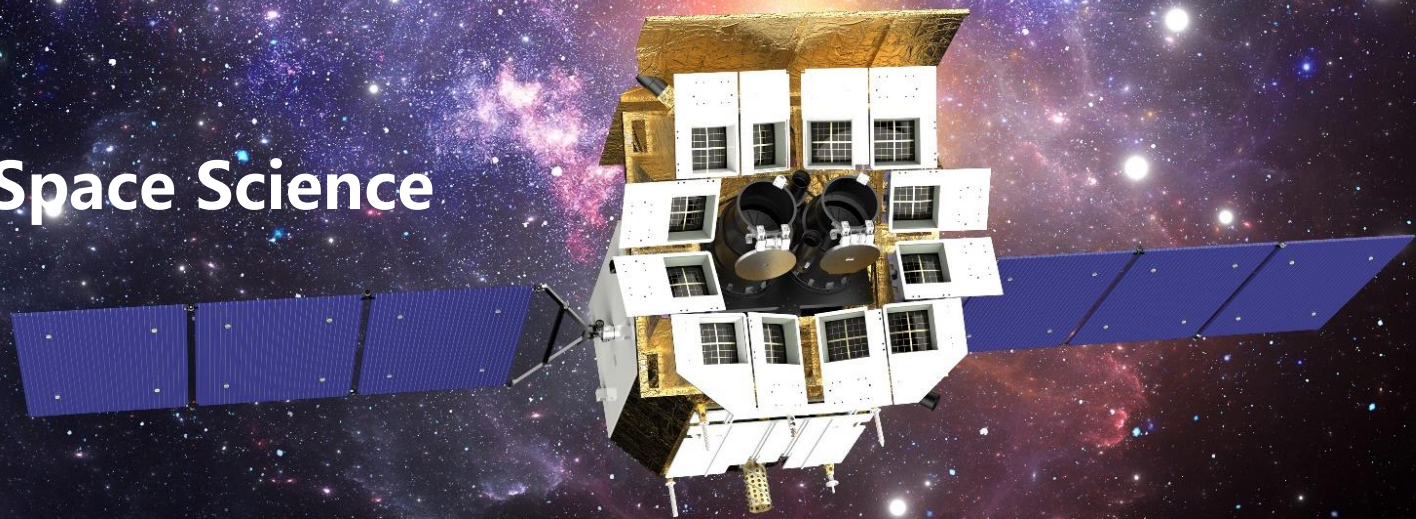




Strategic Pilot Projects in Space Science Einstein Probe (EP)



Space Science Data Center and Commissioning status

JI ZHEN

2024.04.24



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



CONTENT

1. Overview
2. Commissioning status
3. Summary



SSDC Introduction



Responsibilities

1. Data processing and products generation

- Process the raw data from different channels
- Generate the products and alerts at edited levels, auxiliary products and quick-look products

2. Data quality audit and assessment

- Data standardization review
- Data quality analysis, such as the integrity and continuity

3. Data archiving and long-term management

- Collect calibrated data products and data analysis tools generated by scientists
- Manage and archive data products, and ensure the security of long-term storage

4. Data services and application support

- Distribute the products to the science teams and payload teams
- Release data products to scientific users and the public



Milestone



2021.6-2023.2

Requirement Analysis

2023.4-2023.8

Software Development

2023.11-2024.2

Products validation

2023.2-2023.4

Software Design

2023.8-2023.11

Test and Acceptance
Software & Subsystem



A glance of SSDC



Data processing and Product generation

EP卫星在轨运行公共服务平台
EP MISSION ON-ORBIT PUBLIC SERVICE PLATFORM

卫星状况 SATELLITE STATUS

EP 在轨时间: 105天 20小时 21分钟 21秒 轨道号: 1585

2024-04-24 08:13:20
2024-04-24 08:19:58
2024-04-24 06:30:03
2024-04-24 06:40:26

2024-04-24 13:18:51
2024-04-24 13:30:19
2024-04-24 11:35:38
2024-04-24 13:28:42

Data service

einstein probe

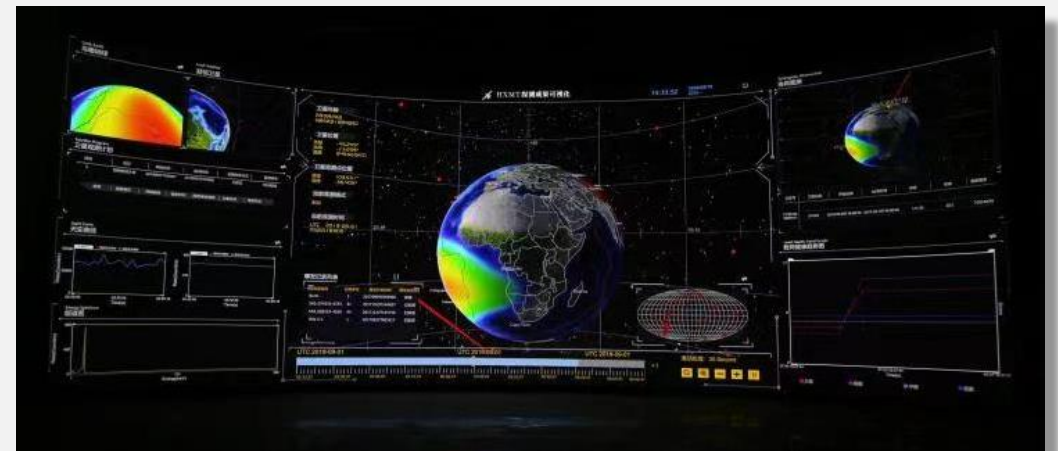
The Einstein Probe (EP) is a mission of the Chinese Academy of Sciences (CAS) dedicated to time-domain high-energy astrophysics.

ANALYSIS TOOLS DATA ACCESS DATA POLICY

INTRODUCTION

The Einstein Probe (EP) is a mission of the Chinese Academy of Sciences (CAS) dedicated to time-domain high-energy astrophysics. Its primary goals are to discover high-energy transients and monitor variable objects. To achieve this, EP employs a very large

Data release



Data visualization



Products Definition



1. Defining the data levels for EP mission
2. Specifying the format of products
3. Developing the data archiving plan

Data Level	Description	Producer
Raw data	X-band, S-band, VHF and Beidou downlink data	GSS
L0A	CCSDS packets	SSDC
L0B	CCSDS packets organized by hour	SSDC
L0C	CCSDS packets organized by observation	SSDC
L1	Products after physical quantity conversion	SSDC and SC
L2 and L3	Calibration products	SC



Requirements



The data processing and management subsystem to serve multiple missions, contains the common parts and customized parts. For EP mission, the subsystem needs to satisfy the following requirements:

- Rapid processing of alert data downlink through Beidou channel (< 10 seconds)
- Data processing and distribution need to meet the timeliness requirements (< 3.5hours)



Commissioning status



In commissioning phase, the data processing and management subsystem is in normal operation

The satisfaction of data processing requirements is as follows:

- The average processing time of Beidou alert data is **less than 5 seconds**
- For one pass, the average data processing and distribution time is **less than 3hours**



Commissioning status



1. Raw data collection *(until April 20th)*

- X-band raw data: 484 files (Chinese station) and 287 files (European station), ~ 2.67TB
- S-band raw data: 523 files, ~634.10MB
- VHF raw data: 212634 files, ~19.37MB
- Beidou short messages: 25243 files, ~1.68MB

2. Product generation

- Auxiliary products: 5 types, 168827 files, ~ 70.12GB
- Data products of 2245 observations, ~ 8.3TB
 - Scientific products: 18 types
 - Engineering products: 186 types
- Quick-look products: 3 types

All data products have undergone data quality assessment



Commission Operation



3. Data Services

- Distribute the L0A, L0B, L1 and auxiliary products to NAOC, IHEP and FXT payload team
- To NAOC:
 - L0A Alert: 397 files, 3.12MB
 - L0B products: 1.08TB
 - L1 products: 4.97TB
 - Auxiliary products: 94.27GB
- To IHEP:
 - L1 products: 4.97TB
- To FXT payload team:
 - L0A products: 232.26GB

4. Data Management

- All the data has been managed by Product Database
- Generating data archives of raw data and editorial level products according to the management standards and starting archiving at the end of March
- Continuously carry out regular backup and remote disaster recovery of archived data



Summary



- The data processing and management subsystem operates steadily
- The raw data is collected and processed normally
- The scientific products are generated continuously
- Data products are distributed timely to science and payload teams
- Data archiving, backup and disaster recovery are executed periodic
- The conditions for data release are ready

Commissioning phase of EP mission is progressing well in SSDC



NSSC

Thanks