

Data acquisition and operation plan

Tadashi Imai

National Space Development Agency of Japan (NASDA)

2-1-1 Sengen, Tsukuba, Ibaraki, Japan 305-0047

Tel: +81-298-52-2440 Fax: +81-298-52-2299

E-mail: timai@rd.tksc.nasda.go.jp

The operation plan of ELISE

The observation data of ELISE is planned to be transferred to NASDA Katsuura Tracking and Communication Station(35° N) by High-rate S-Band(HSB) downlink. The rate of HSB is 1 [Mbit per second]. Katsuura station receives the ELISE data 4 paths per day. The average time of one path is about 9 minutes and it is about 7 minutes to use for transferring data. One of four paths is used for satellite ranging and command link. The rests, three paths, are used for data down link. Therefore, the total amount of downlink data per day is 1.26 Gbits.

$$(1 \text{ [Mbps]} \times 3 \text{ [times / day]} \times 7 \text{ [min]} \doteq 1.26 \text{ [Gbits / day]})$$

The operation mode of ELISE

ELISE has 3 channel, first channel observes fundamental wavelength(1053nm) by Analogue (AN) mode Avalanche Photo-Diode (APD), second observes fundamental wavelength(1053nm) by Photon-Counting (PC) mode APD, third observes SHG(527nm) by PC mode APD. There are mainly three observation modes in the following table.

Table 1 The observation mode of ELISE

channel \ mode	ch1 1053nm (AN)	ch2 1053nm (PC)	ch3 527nm (PC)	Data Rate*
observation mode I	ON	OFF	OFF	34 [kbps]
observation mode II	OFF	ON	ON	64 [kbps]
observation mode III	ON	ON	ON	94 [kbps]

* In case of 20 data integration

The observation mode I intends to observe mainly clouds by Analog detector, the observation mode II intends to observe mainly aerosols and atmospheric molecule by Photon Counting detector in night time, and the observation mode III intends to observe all targets, clouds, aerosols and atmospheric molecule, by Analog detector and Photon Counting detector simultaneously, in night time.

The actual operation modes of ELISE will be the combination of these observation modes. The example of an operation mode is shown in fig.1 and 2.

time	operation	time	operation	time	operation
0		8		16	
1		9	MODE I	17	Down Link
2	MODE I	10		18	Down Link
3		11		19	Down Link
4		12		20	Down Link
5		13		21	Ranging
6		14		22	
7		15		23	

In case of Mode I (Integrated 20 data)

Fig. 1 The example of an operation mode

time	operation	time	operation	time	operation
0		8		16	
1		9	MODE II	17	Down Link
2	MODE III	10		18	Down Link
3	MODE III	11		19	Down Link
4		12		20	
5	MODE I	13		21	Ranging
6		14		22	
7		15		23	

In case of Mode I, II, III (20 data integration)

Fig. 2 The example of an operation mode

time	operation	time	operation	time	operation
0		8		16	
1		9	↕ MODE II	17	↓ Down Link
2	↕ MODE III	10		18	↓ Down Link
3	↕ MODE III	11		19	↓ Down Link
4		12		20	↓ Down Link
5	↕ MODE I	13		21	↓ Ranging
6		14		22	
7		15		23	

In case of Mode I, II, III (Integrated 20 data)

Fig. 3 The example of an operation mode

The annual operation plan will be made by NASDA MDS project in cooperation with Data User (especially NIES) before the launch of ELISE. After the launch, the operation mode is going to be changed once per week (to be determined) according to the scheduled operation plan. The basic operation plan may be changed when required. The image of the operation of ELISE is shown in fig. 4.

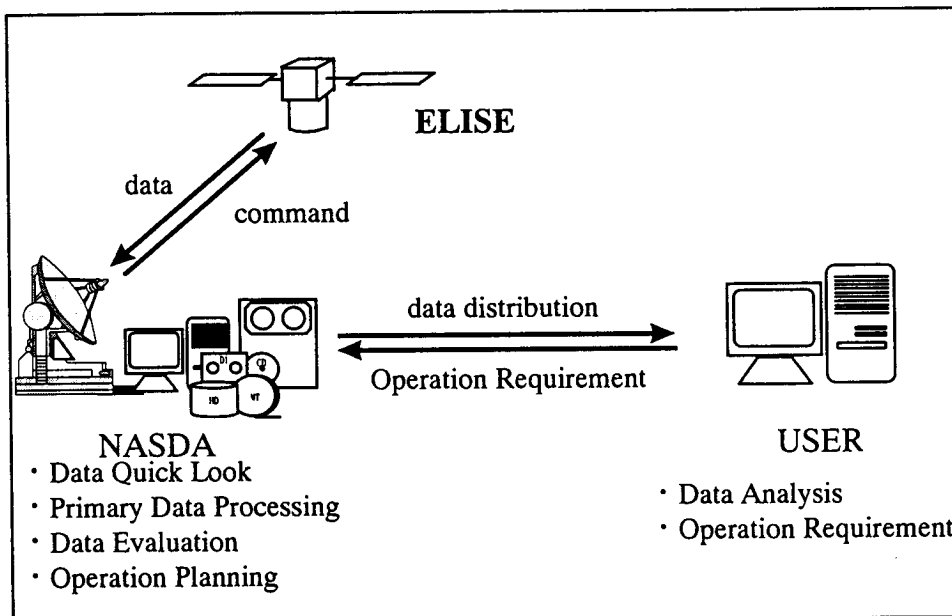


Fig.4 The image of the operation of ELISE

The flow of the ELISE mission data

The ELISE mission data and the tracking data is combined and preserved in the Data Base (ELISE DB). And the primarily processed data is also preserved in the ELISE DB. The contents of the data processing is under consideration. We would like to determine the contents of processing in cooperation with data user. Fig. 5 shows the concept of the ELISE mission data flow.

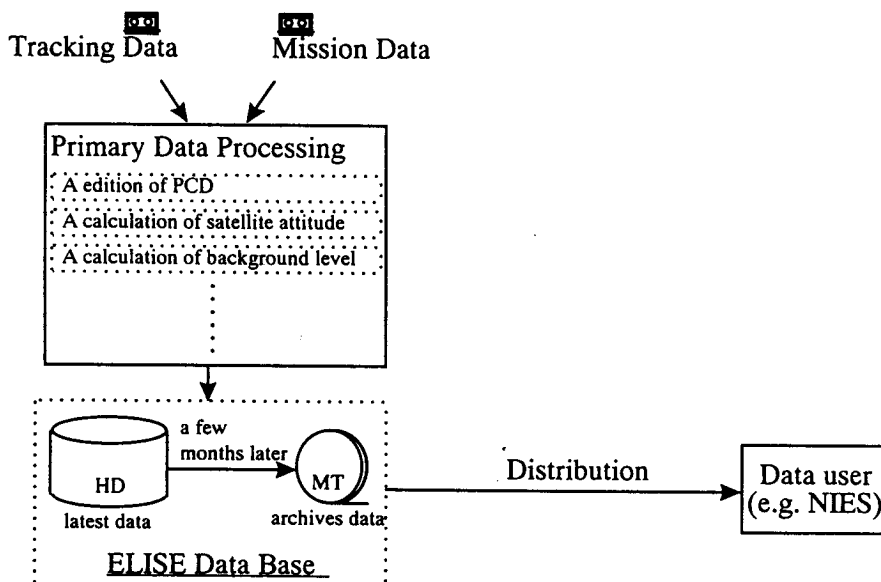


Fig. 5 The concept of the ELISE mission data flow