

# Telescope Control Software OF AST3-2



AST3-2

AST3-1

# OUTLINE

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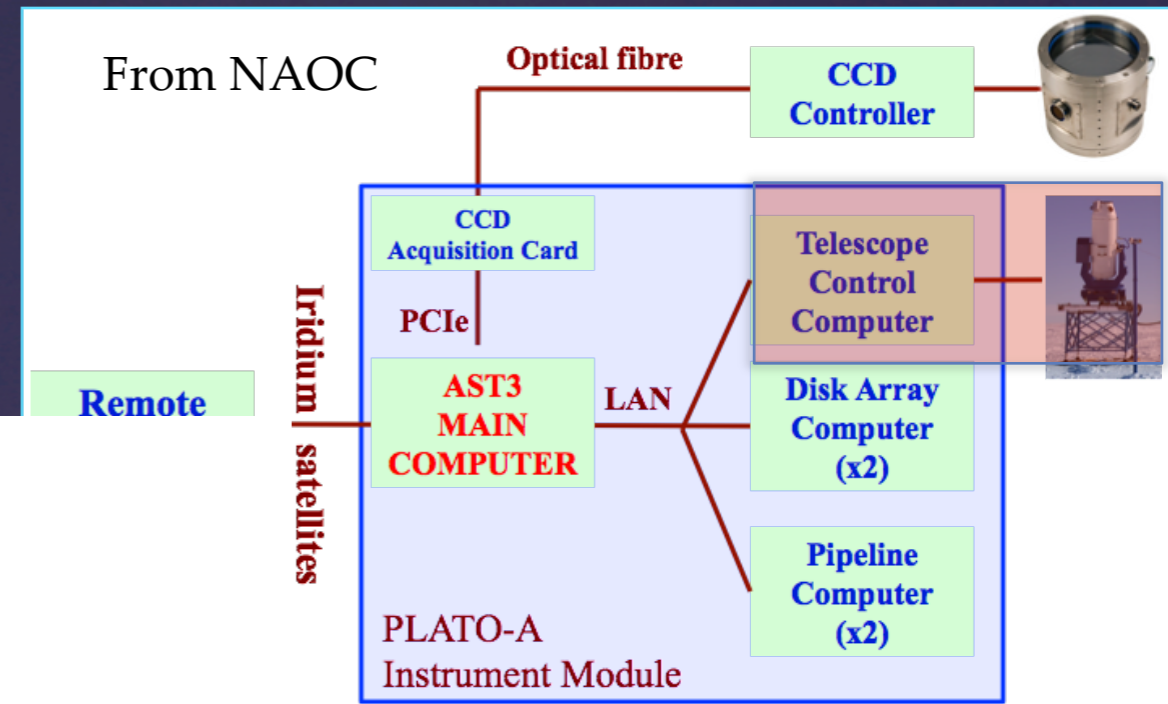
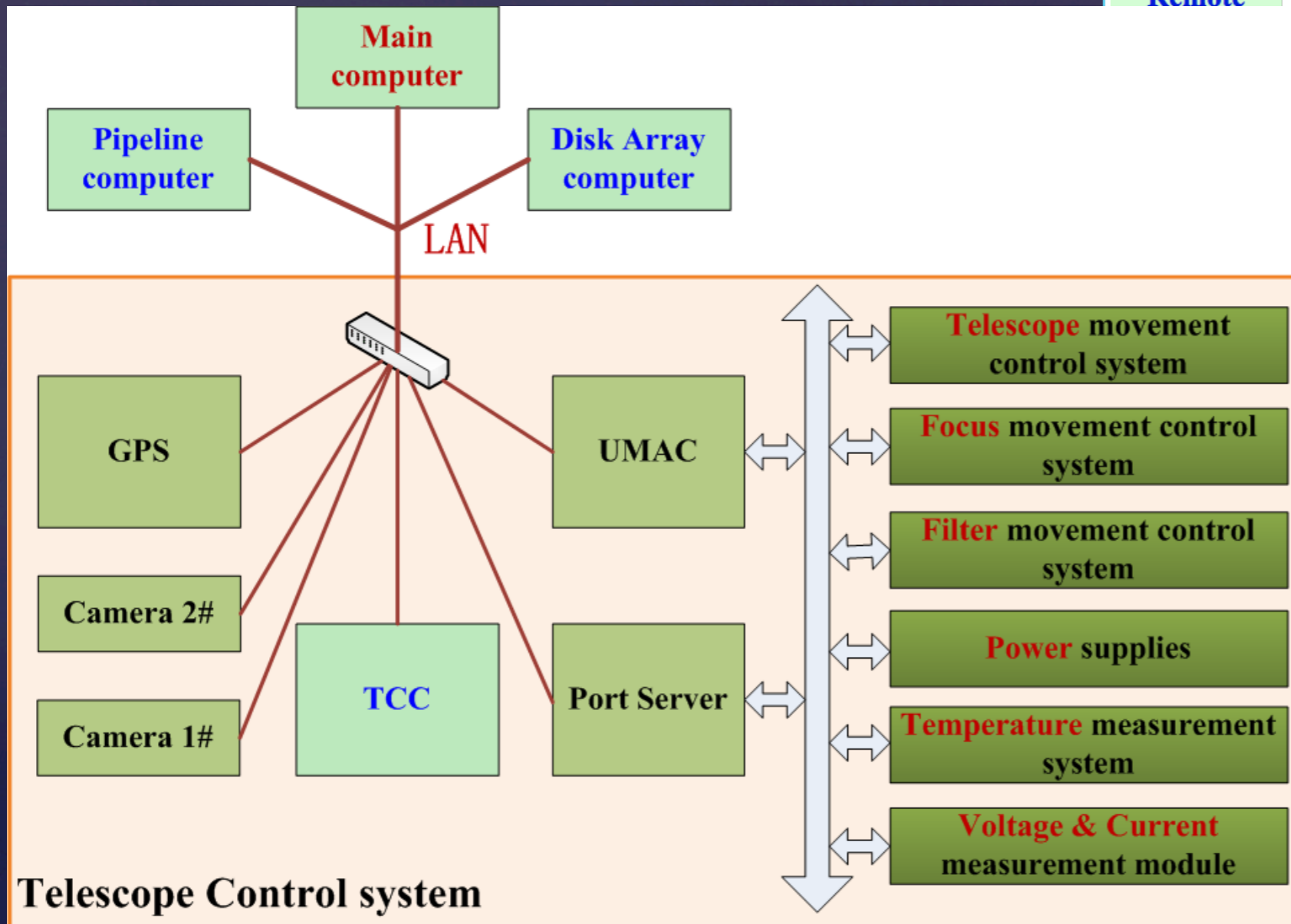
1. AST3-2 control system

2. Functions of TCS

3. Status of AST3-2

# AST3-2 Control System

*In Main Computer's view* →



← *In TCC's view*

# OUTLINE

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1. AST3-2 control system
2. Functions of TCS
3. Status of AST3-2

# Functions of TCS

# Interface

**AST3-2 Telescope Control Software**

File Help

**Time**

LST : 10 h 15 m 32.630 s  
 BJT : 11 h 13 m 07.078 s  
 UTC : 3 h 13 m 07.078 s  
 2014-10-20

**Devices**

- Dev0\_Umac
- Dev1\_DrvRA1
- Dev2\_DrvRA2
- Dev3\_DrvDEC1
- Dev4\_DrvDEC2
- Dev5\_VolCur
- Dev6\_Heat
- Dev7\_Mo+LVDT
- Dev8\_Temp
- Dev9\_Server
- Dev10\_Cam1
- Dev11\_Cam2

**V&I**

V=238.1  
 I= 1.044  
 PF=-0.715  
 Pwr=177.8

**RA**

Pos **89 d 31 m 50.09 s**  
 Status: Homed

Vel 0.00 "/s  
 F\_Err 0.00 "  
 RMS 0.00 "

DrvE 0,0  
 DrvI 0.002,-0.015  
 DrvVel 0.000,0.000

I322 3600.00"/s  
 P329 7937694.7

P386 0  
 PTarg NULL  
 PTime NULL

I330-5 30000,100,100,30000,0,0

Enable  MX39  
 Home  P317  
 S\_Lmt\_P  M331  
 S\_Lmt\_N  M332  
 H\_Lmt\_P  M321  
 H\_Lmt\_N  M322  
 PosDone  MX40  
 FE\_Err  MX42  
 Motor\_Err  MX43

**DEC**

Pos **0 d 0 m 0.08 s**  
 Status: Not Homed

Vel -0.19 "/s  
 F\_Err 0.00 "  
 RMS 0.00 "

DrvE 0,0  
 DrvI 0.012,0.009  
 DrvVel 0.000,0.000

I222 15.00"/s  
 P229 -642746.4

P286 2  
 PTarg NULL  
 PTime NULL

I230-5 27000,10,10,25000,0,0

Enable  MX39  
 Home  P217  
 S\_Lmt\_P  M231  
 S\_Lmt\_N  M232  
 H\_Lmt\_P  M221  
 H\_Lmt\_N  M222  
 PosDone  MX39  
 FE\_Err  MX42  
 Motor\_Err  MX43

**Filter**

F1 **24.9 d** **N**  
 Motor 0.0 d  
 F1\_Enabled   
 F1 RetireP 0.0 d  
 F1 WorkP 81.5 d

**Focus**

POS **0.000 mm**  
 LVDT **0.000 mm**  
 A4012 0.0000V  
 Enabled   
 VEL 0.0 mm/s  
 IS22 =16  
 0.057 mm/s

**Emergency Stop**

**Temperature**

T 1=12.3 C  
 T 2=-23.4 C  
 T 3=34.5 C  
 T 4=-45.6 C  
 T 5=56.7 C  
 T 6=-67.8 C  
 T 7=78.9 C  
 T 8=-89.0 C  
 T 9=90.1 C  
 T 10=-1.2 C

MOVE TELESCOPE | POINT\_TRACK | FOCUS & FILTER | INITIALIZATION

**RA**

Home1 Enable Move +  
 Home2 Disable Move -

RA Move to  
 + 0 d 0 m 0.00 s  
 - 0 d 0 m 0.00 s  
 Go Stop

Set Speed= 0 "/s  
 Send Hi Para Send Lo Para  
 Stop all movement & Disable

**DEC**

Home1 Enable Move +  
 Home2 Disable Move -

DEC Move to  
 + 90 d 0 m 0.00 s  
 - 90 d 0 m 0.00 s  
 Go Stop

Set Speed= 0 "/s  
 Send Hi Para Send Lo Para  
 Stop all movement & Disable

**Actual RMS**

Rec RA  
 Rec DEC

Home1 RA= 180  
 Home1 DEC= 0  
 Home2 RA= 180  
 Home2 DEC= 0

ArcSec <-> Counts  
 0 " = 0.00 cts  
 0 " cts= 0.00 "

Check Encoder  
 Check RAENC  
 Check DECENC

Site Info:Lgt=77.09566, Lat=-80.41744 Run: 0 Hour (s) V3.1.1410 NIAOT-中国科学院南京天文光学技术研究所

# Functions of TCS

## Pointing and Tracking

Coordination of J2000

Precession

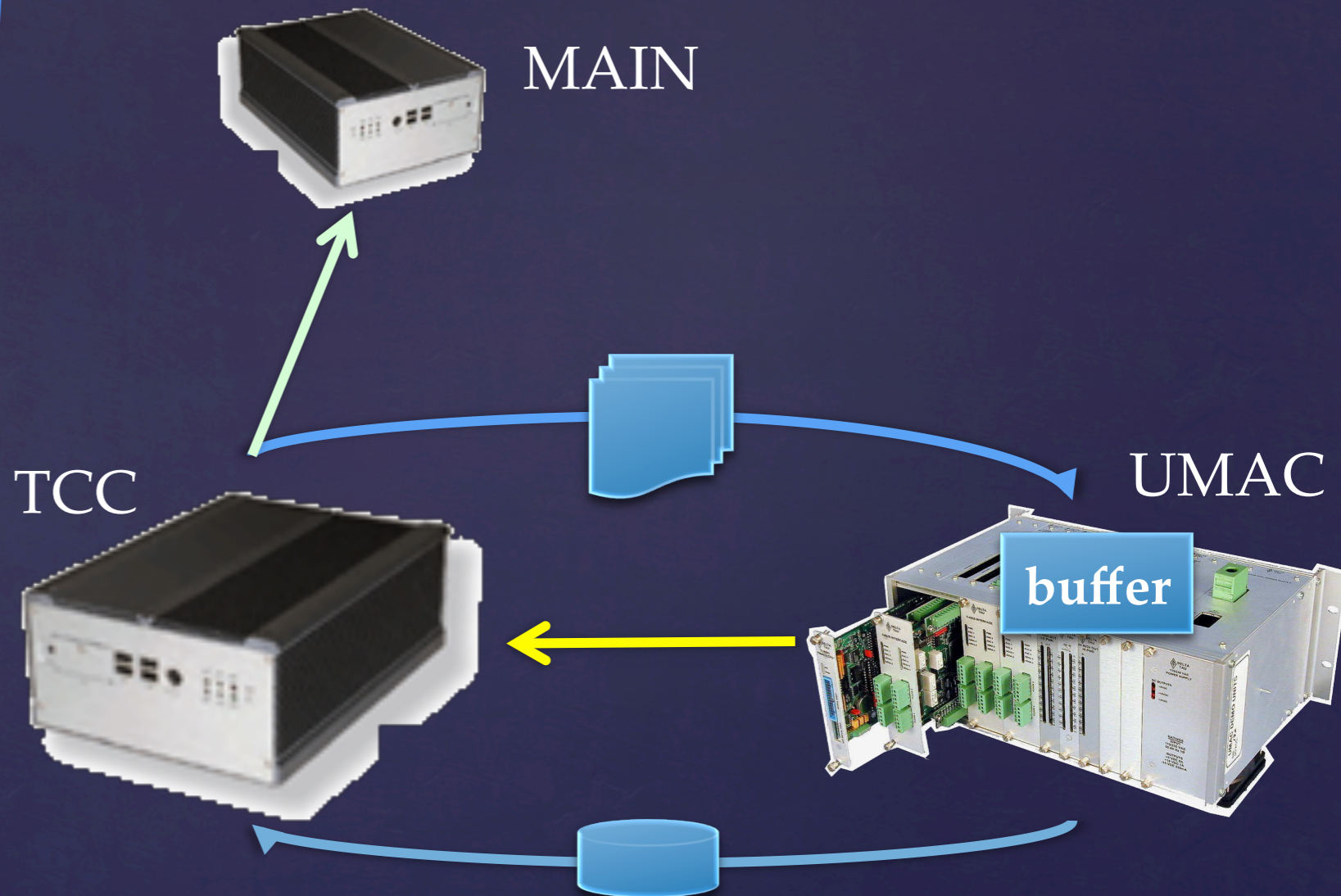
Nutation

Parallax

Atmospheric refraction

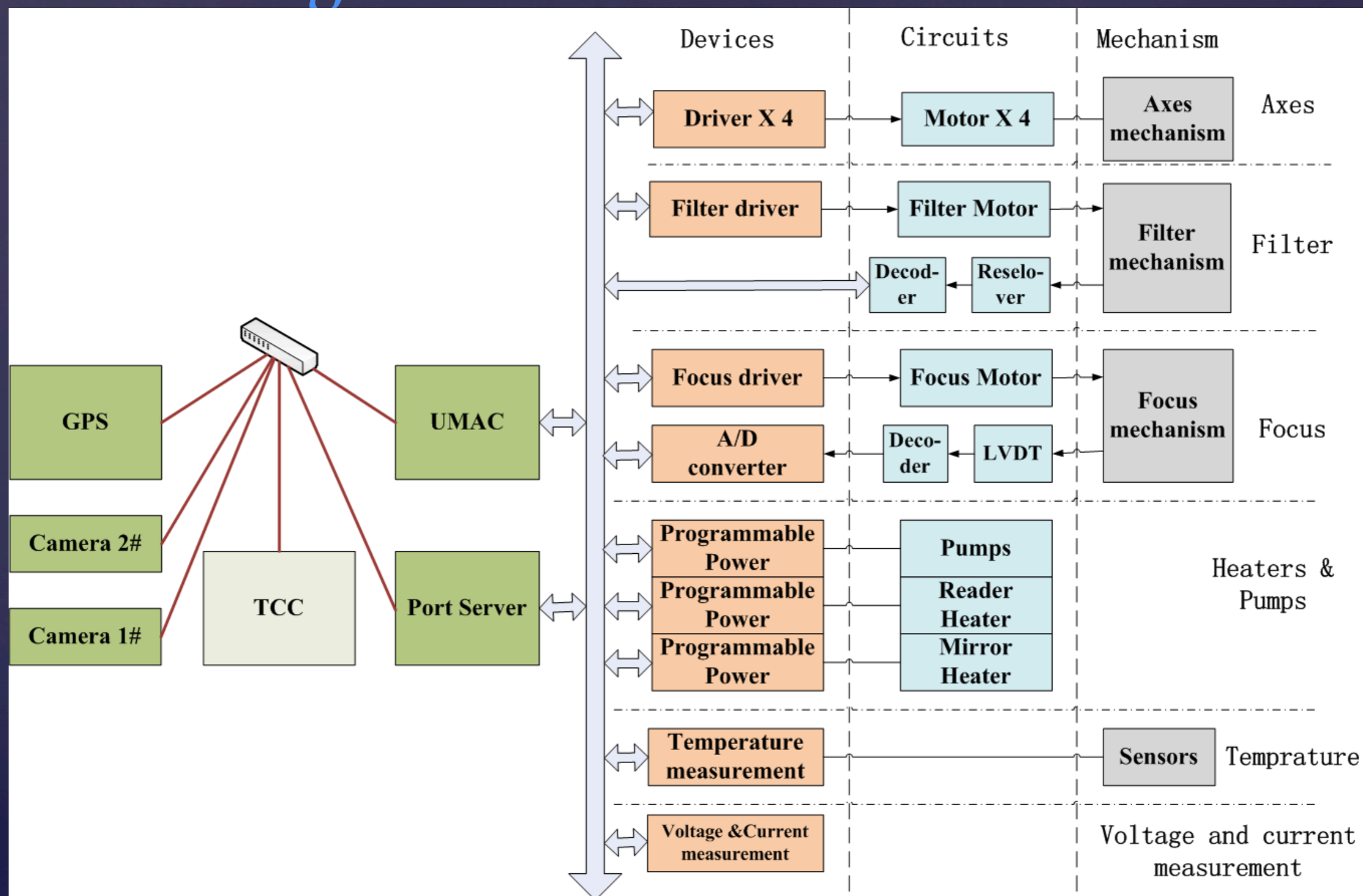
Misalignment  
correction

Target position in  
telescope coordination



# Functions of TCS

## Devices Management



# Functions of TCS

*Receiving commands from network or from file*

34 commands are designed

Observing

Setting parameters

Testing

Getting status

format: `<ID=%d> [ <para1=value1> ] [ <para2=value2> ] ...`

*Generating logging files*

More than 6 files are generated every day.



# Functions of TCS

## Handling warnings and errors

12 possible types

1	<ERR=CMD>
2	<ERR=RANGE>
3	<ERR=LMT>
4	<ERR=UMAC>
5	<ERR=PORT>
6	<ERR=PLCNSTART>
7	<ERR=FOLERR>
8	<ERR=TIMEOUT>
9	<ERR=SOFTWARE>
10	<ERR=OVERVI>
11	<ERR=BREAK>
12	<ERR=NOTHOMED>

# Functions of TCS

## *Summary*

1. Pointing and tracking
2. Devices management
3. Receiving and processing commands  
from network or from files
4. Generating logging files
5. Handling warnings and errors

# OUTLINE

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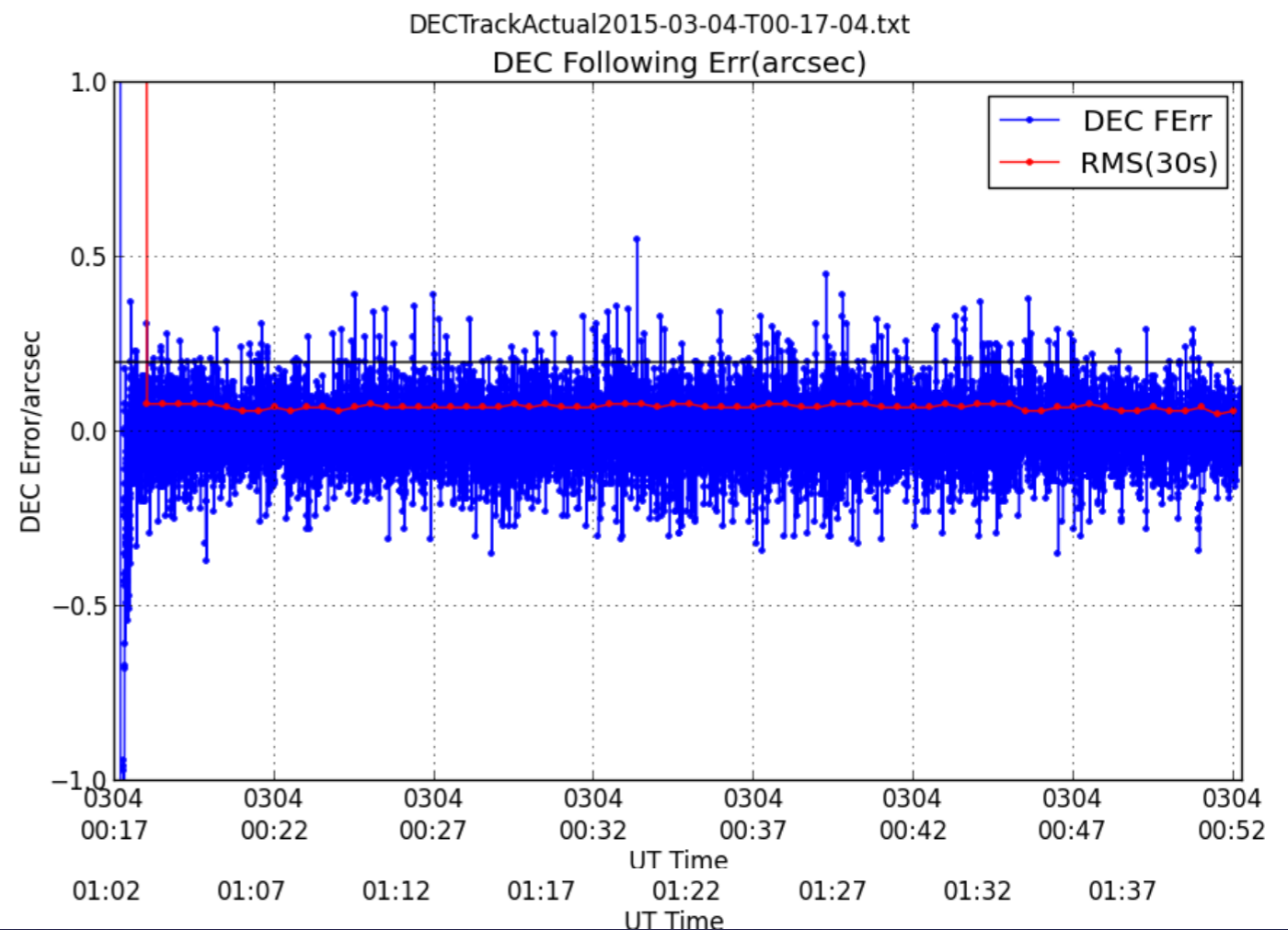
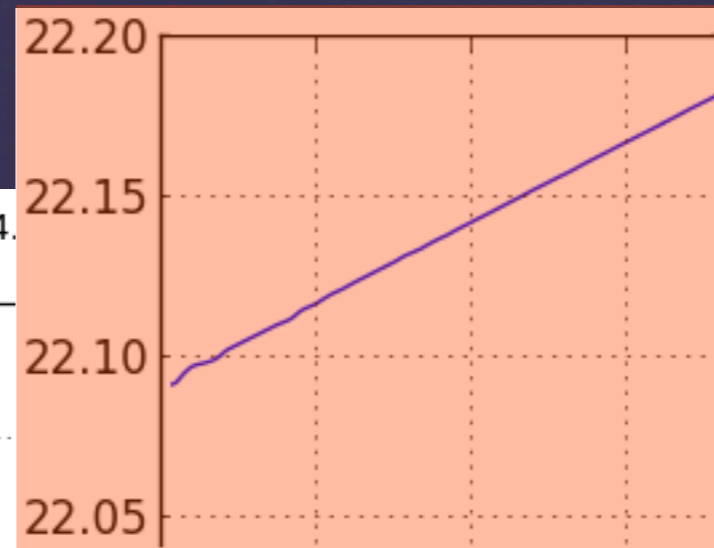
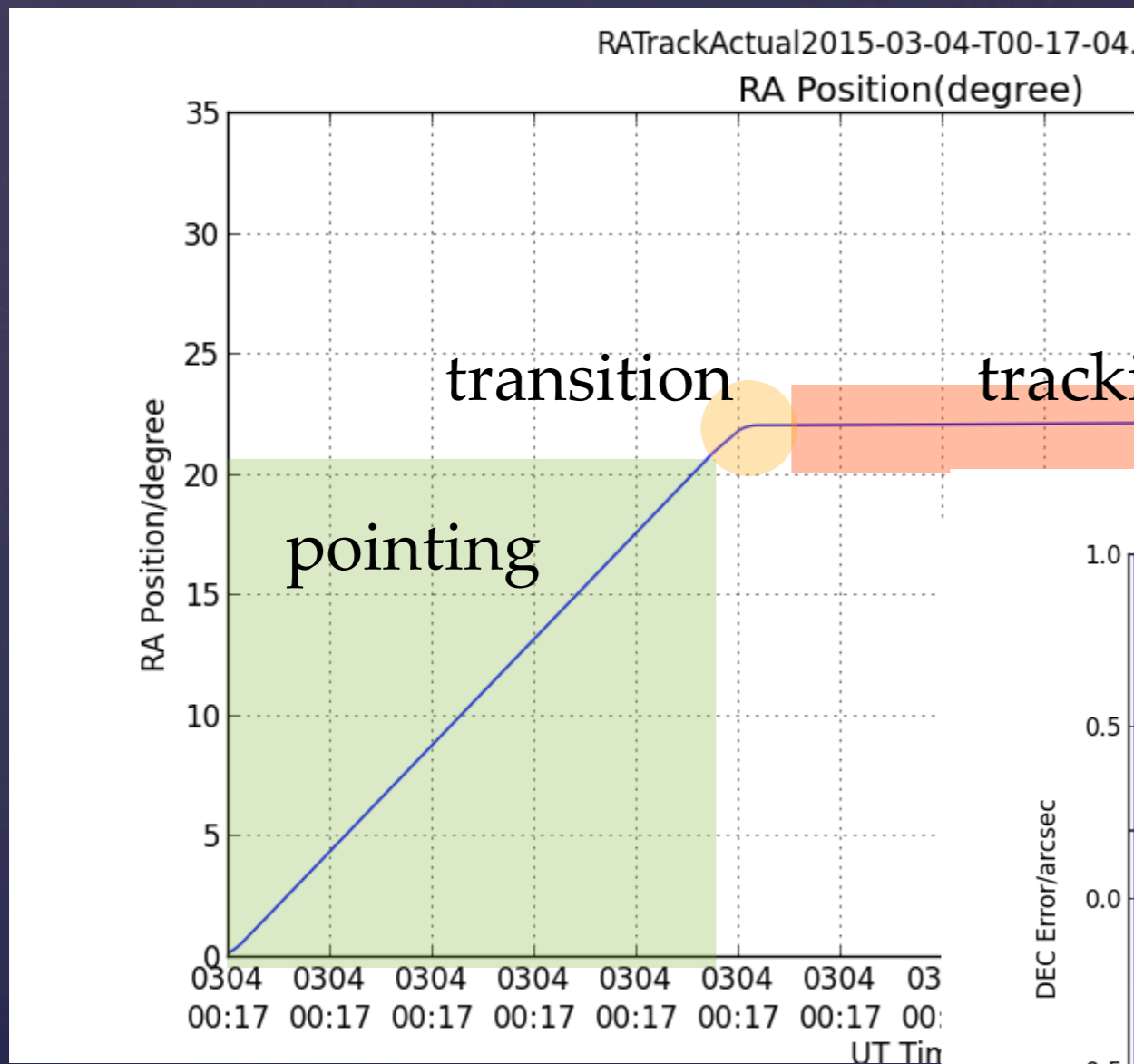
# Status of AST3-2

*What we do every day since Jan.23*

1. Moving the telescope  
(pointing and tracking for ½ hour without exposure)
2. Moving the focus platform once a week
3. Monitoring the status of devices
4. Getting log files and camera images every day

# Status of AST3-2

## Pointing and Tracking



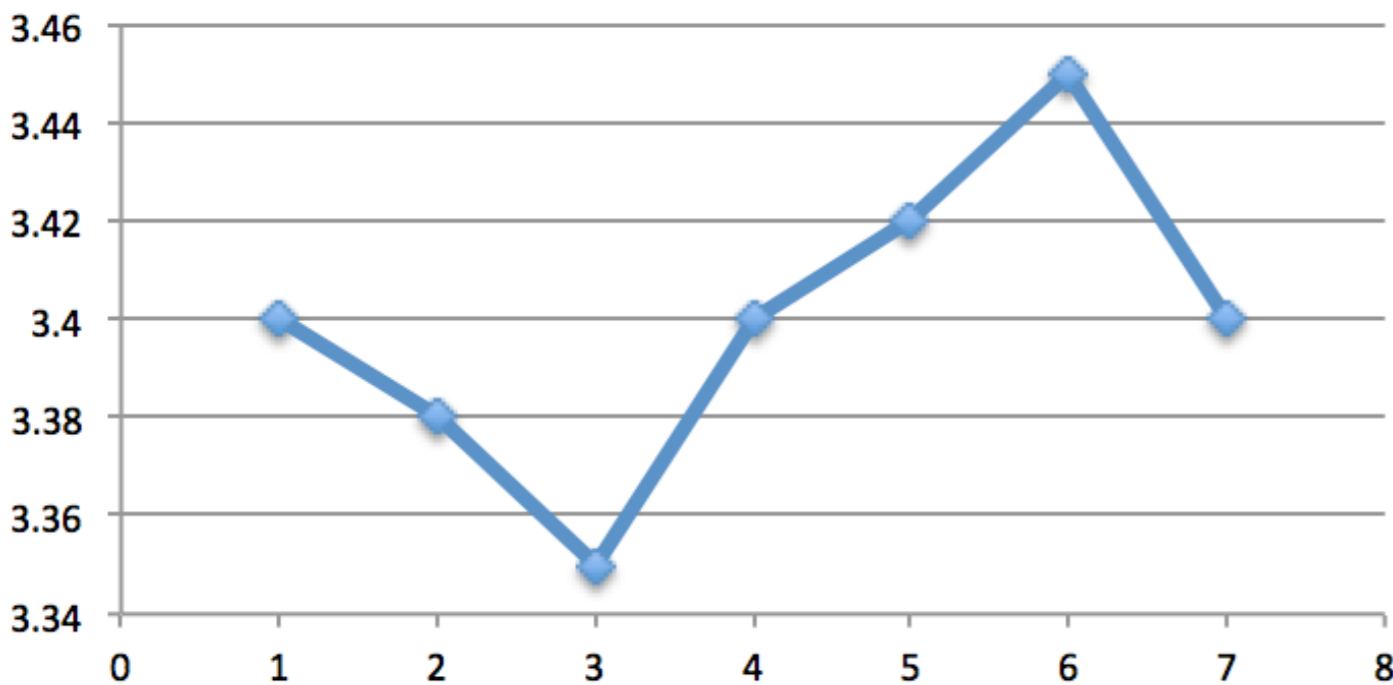
PV: 1 arcsec

RMS: < 0.2 arcsec

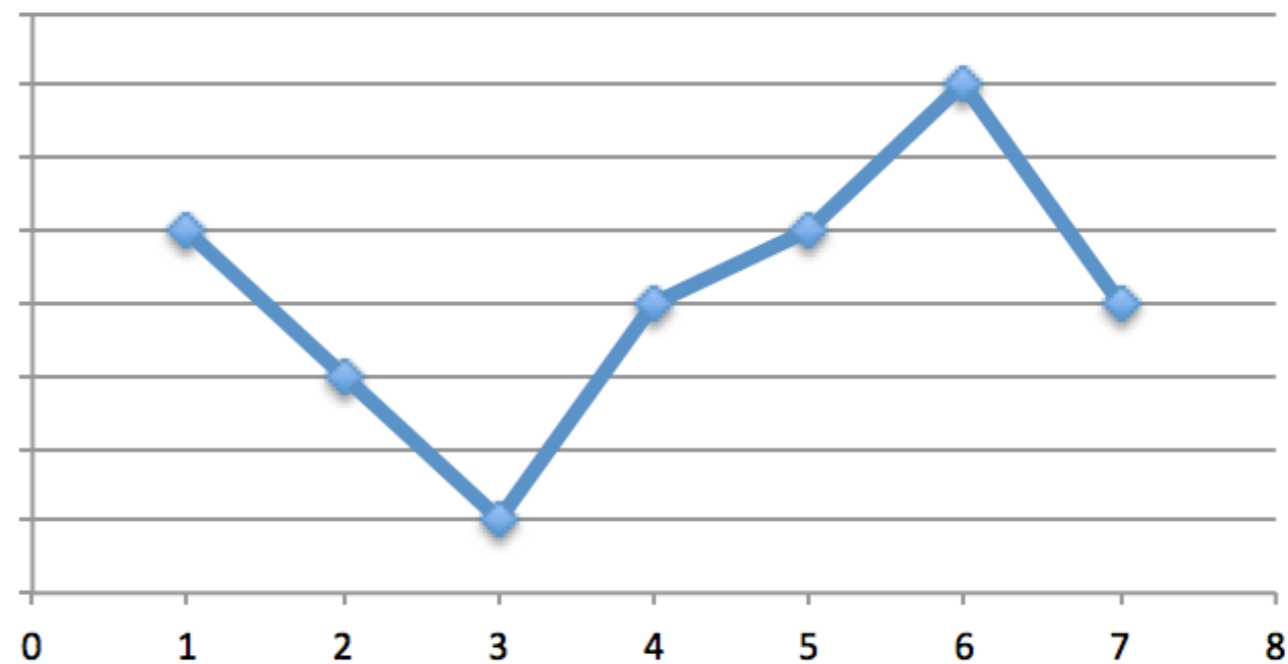
# Status of AST3-2

## Focus Platform Movement

Focus Target Position

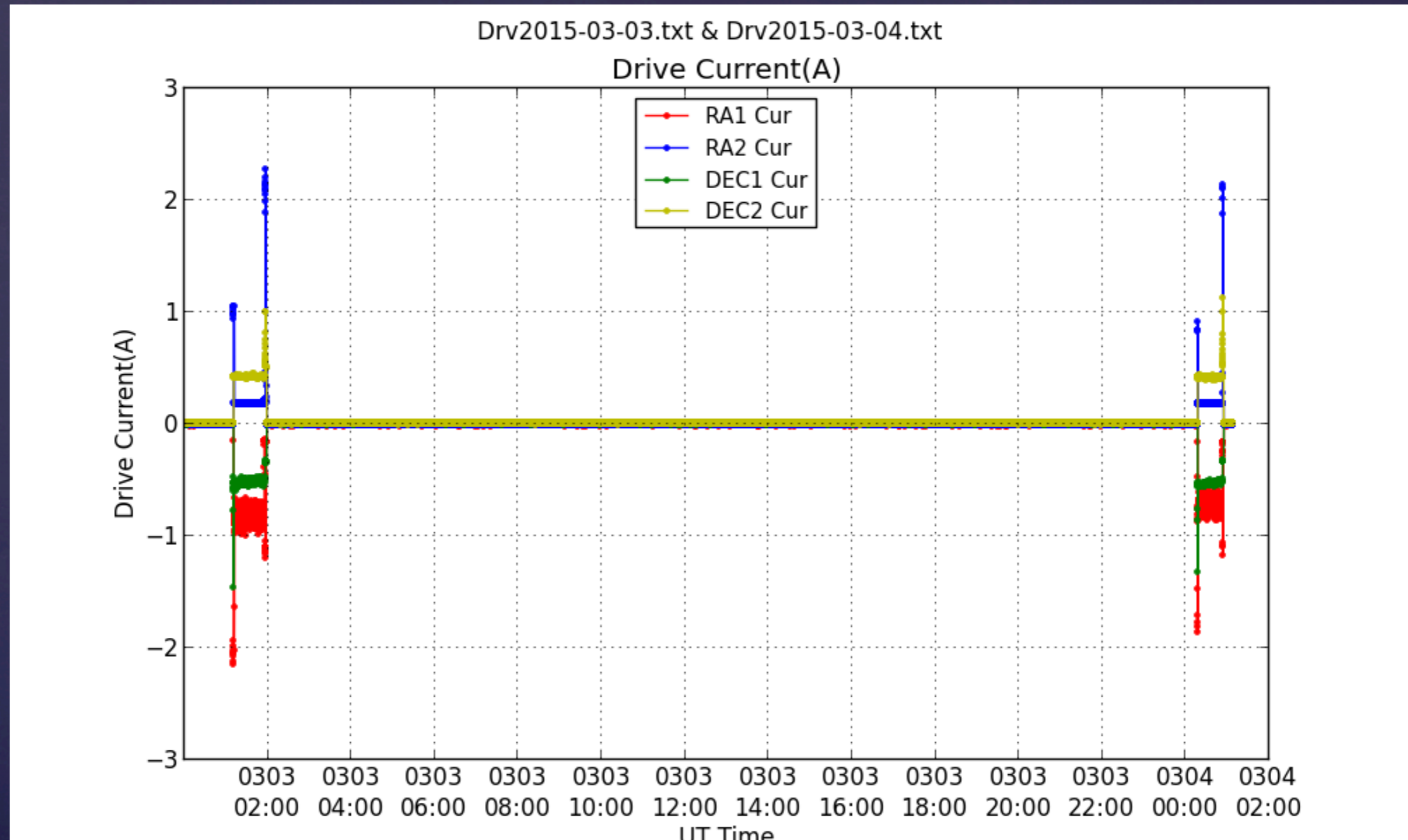


Focus Position Feedback



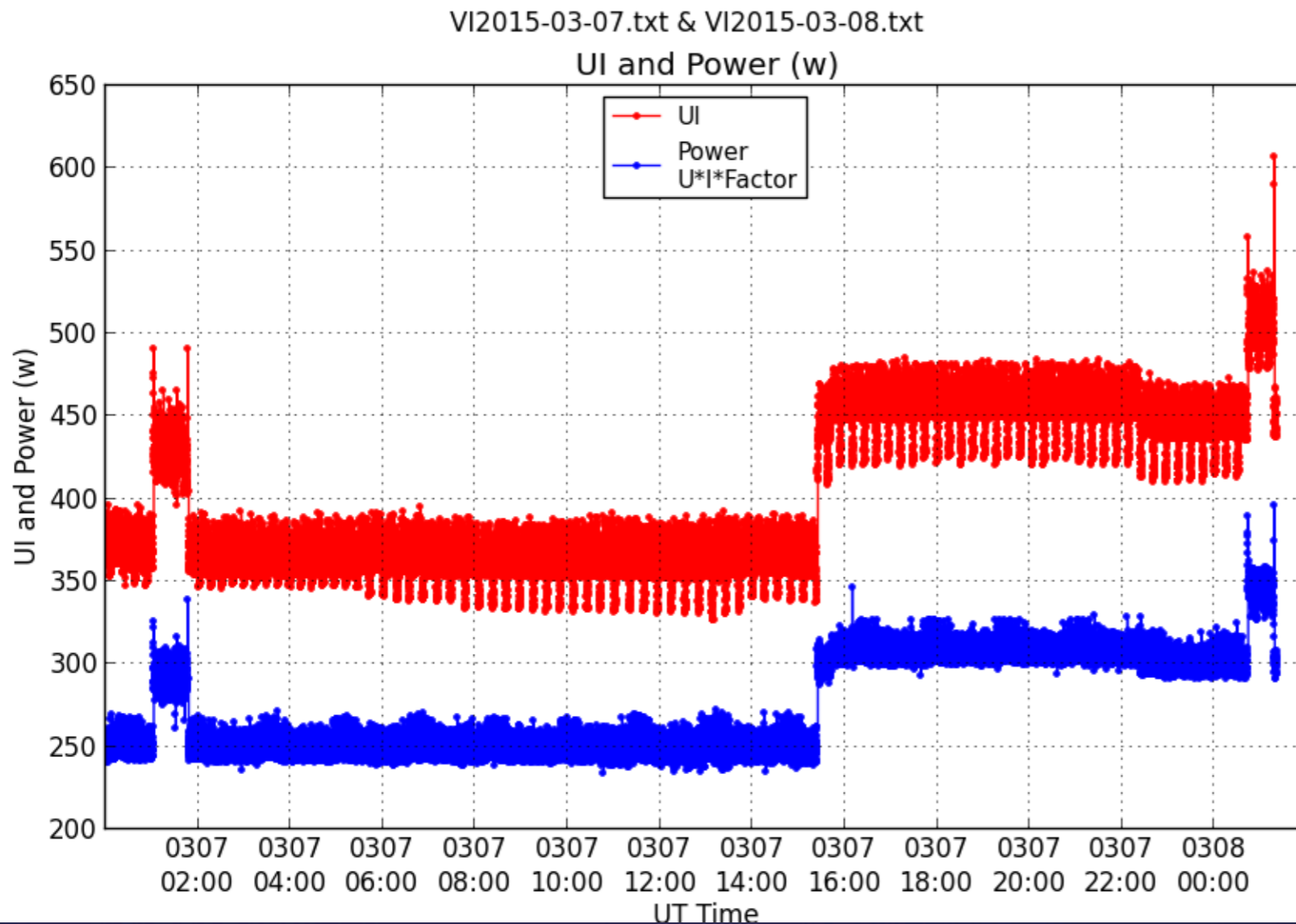
# Status of AST3-2

## Drivers Current



# Status of AST3-2

## Power consumption

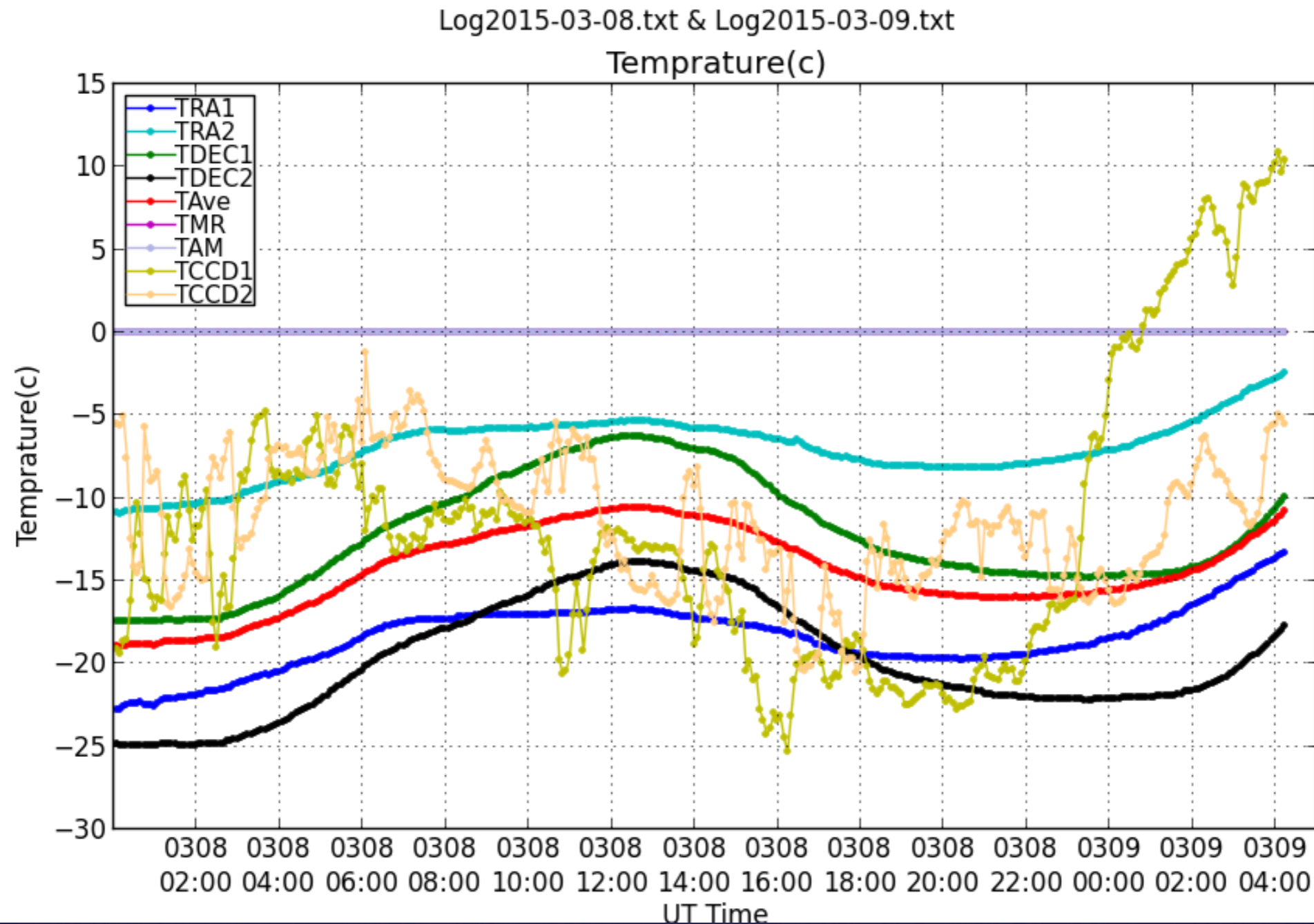


Heater in CCD control box  
Heater on Mirror  
Heater on Readers of Encoder  
Tracking  
Pointing



# Status of AST3-2

## Temperature of some devices



# Status of AST3-2

## *Summary*

Movement is quite OK.

Tracking is healthy with high performance.

Focus movement is OK.

Filter keeps in working position.

# IMAGES FROM DOME A

03-09-2015 星期二 02:30:52

*Thanks for your attention!*



Camera 01