Answer to Jasem - EN

mercredi, 9 juin 2021 12:31

Basically, at this stage of reflection, I think there is a bug somewhere in the interface between Kstars, EKOS and the EQMod driver. I'll go through the whole sequence since the switch to daylight saving time in 2021.

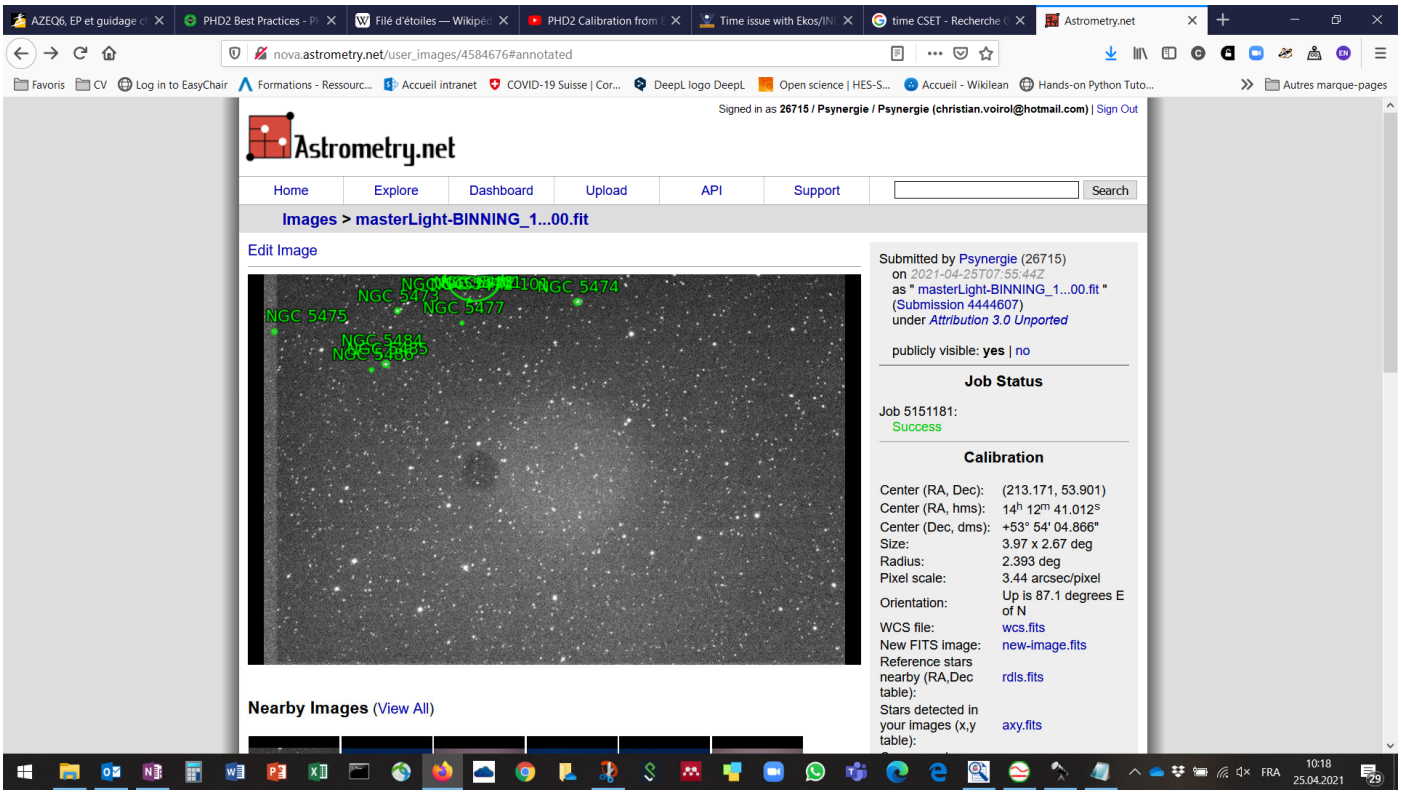
At the very beginning, on 23.04.2021, I took pictures of M101 with a 270mm zoom. As during the whole winter, I asked for a GOTO on the targets without any problem. When I looked at my images, there was only a tiny bit of M101 in the upper left corner. I then looked into why. The coordinates reported by Astrometrics were off by more than 2° for the same UTC time.

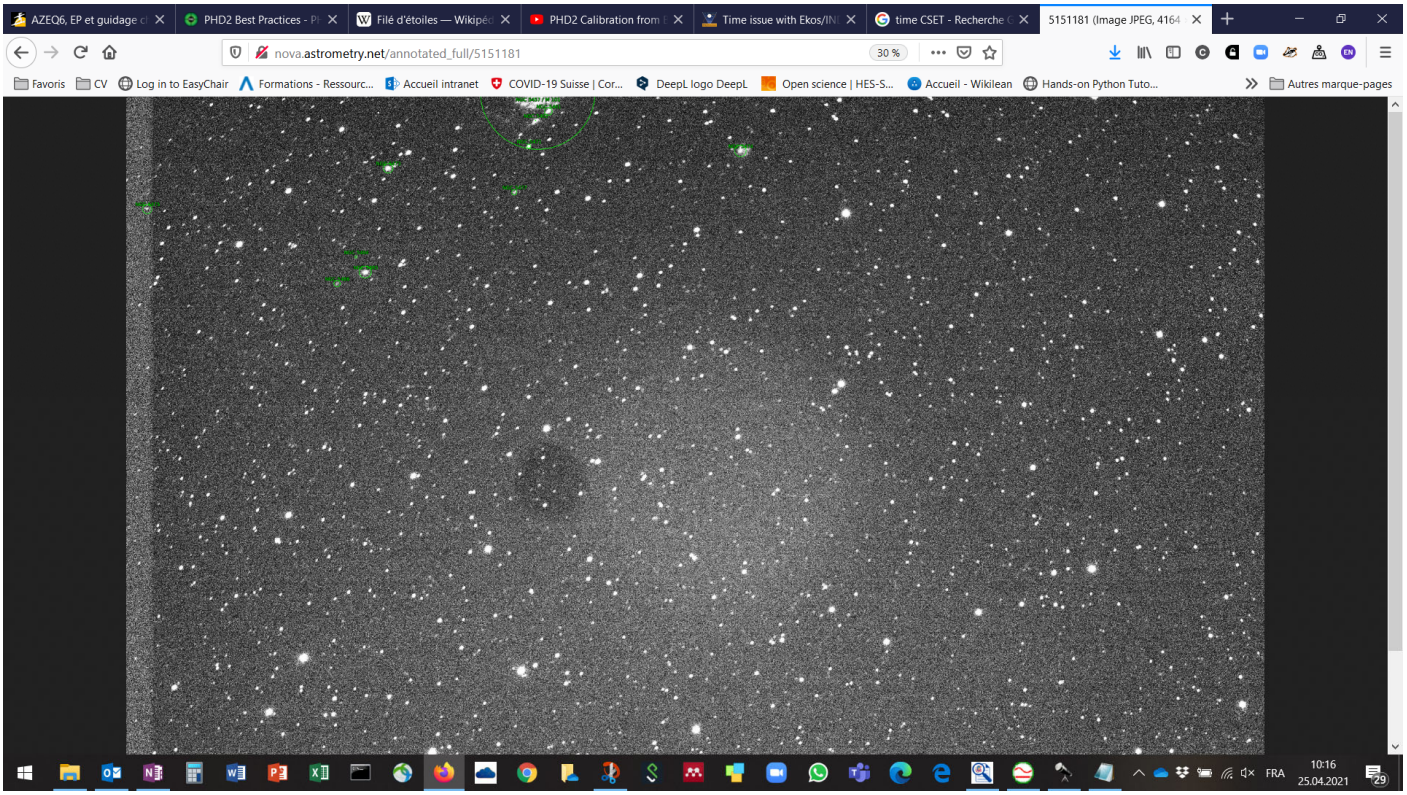
Coordinates image Astrometry.net

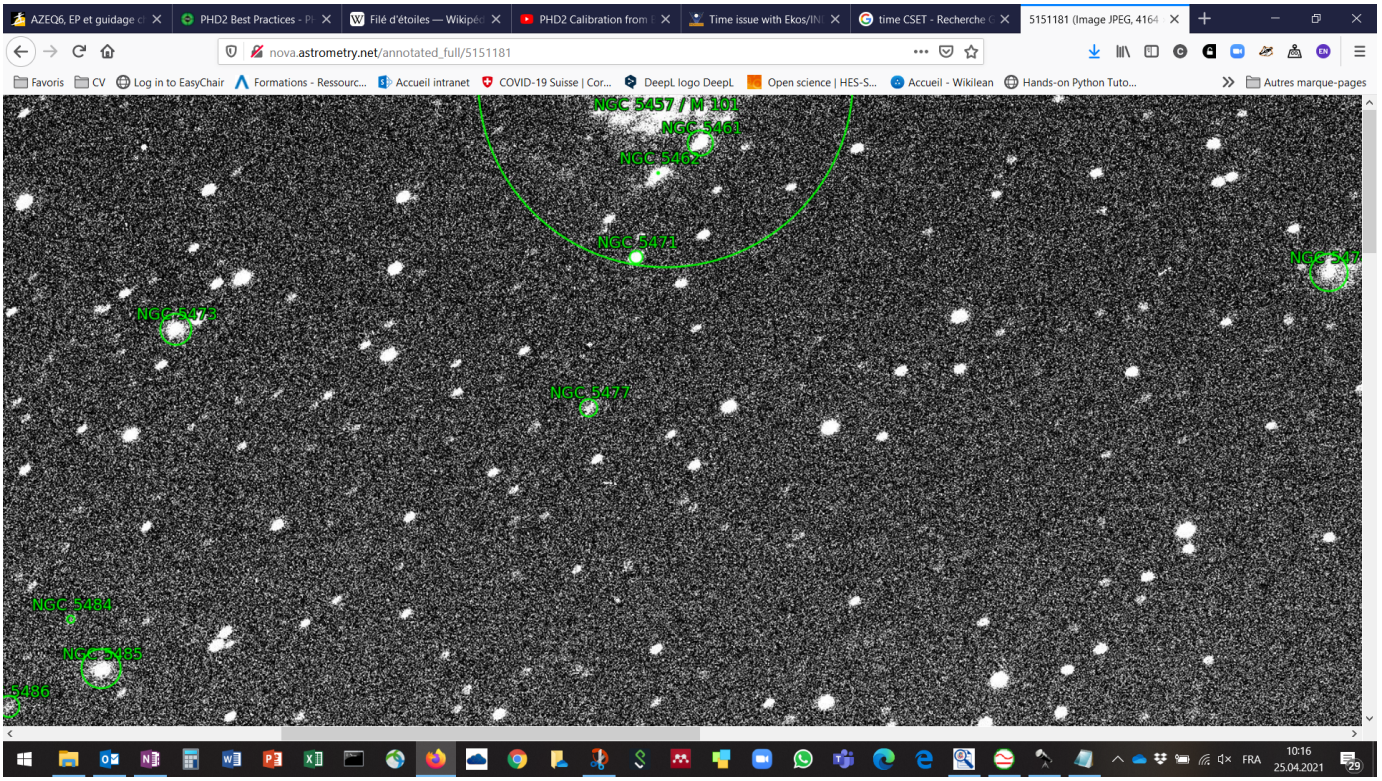
Center (RA, Dec): (213.171, 53.901)

Center (RA, hms): $14^h\ 12^m\ 41.012^s$

Center (Dec, dms): +53° 54' 04.866"







Coordinates of my place : Bois-Rond

46°31'56.5"N 6°16'07.0"E
46.532371, 6.268597
1104 metres

Real coordinates of M101

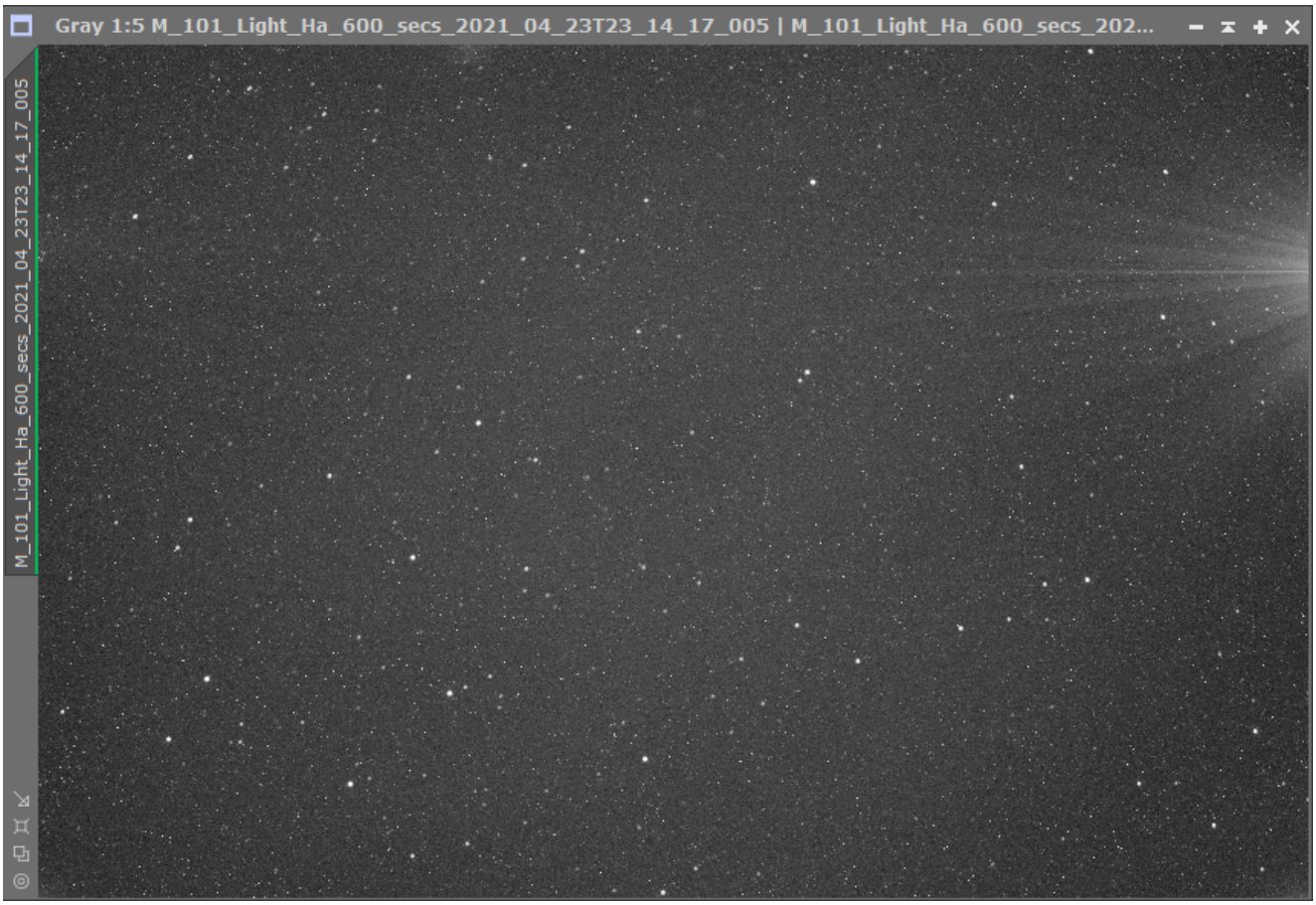
Right ascension: 14h 03m 12.6s
Real: 14*15+03*15/60=210.75

Declination: +54°20’57”

Differences

Image : 213.17 - Real: 14*15+03*15/60=210.75
213.17-210.75=2.42°

The image below was photographed on 23.04.21 à 23:14:17 - M_101_Light_Ha_600_secs_ 2021-04-23T23-14-17_005. This is one of my Master above.



The EKOS script, called ekos-2021-04-23T20-22-52,created at 20:22:52 local time

ekos-2021-04-23T20-19-04	23.04.2021 20:20	Fichier ANALYZE	1 Ko
ekos-2021-04-23T20-22-52	23.04.2021 23:48	Fichier ANALYZE	92 Ko
ekos-2021-04-23T23-49-05	24.04.2021 00:47	Fichier ANALYZE	64 Ko
ekos-2021-04-24T09-30-25	24.04.2021 14:24	Fichier ANALYZE	5 Ko
ekos-2021-04-24T14-26-38	24.04.2021 14:26	Fichier ANALYZE	1 Ko

is the following:

#KStars version 3.5.2. Analyze log version 1.0.

AnalyzeStartTime,2021-04-23 20:22:52.000,CEST

(Central European Summer Time (CEST) is 2 hours ahead of Coordinated Universal Time (UTC). This time zone is a Daylight Saving Time time zone and is used in: Europe, Antarctica)… This is correct.

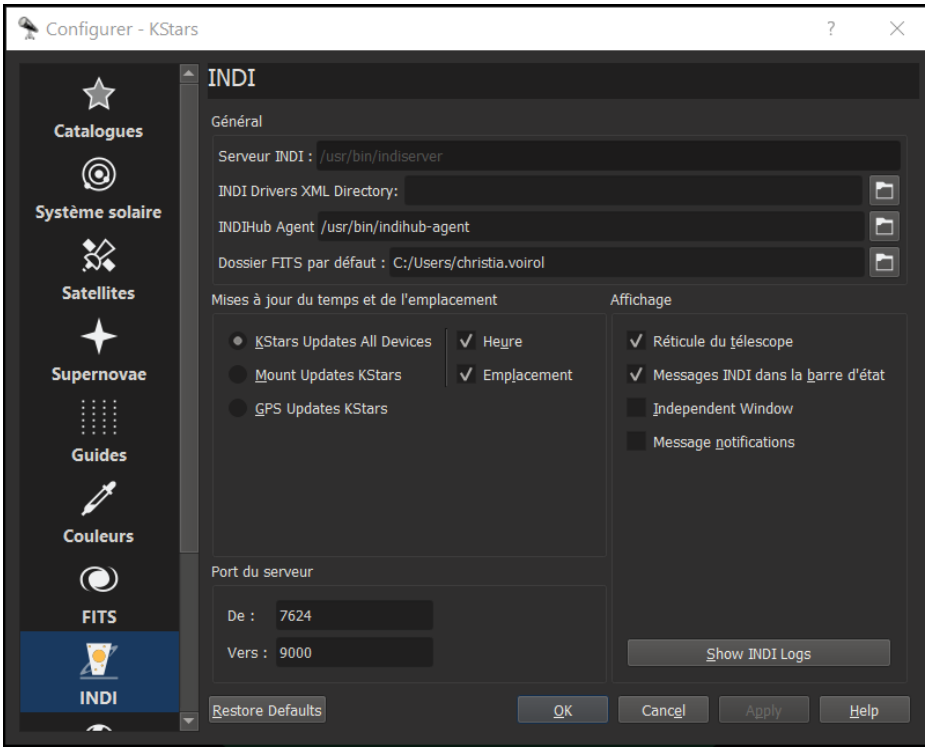
MountState,0.000,Error
GuideState,0.416,Disconnected
MountCoords,2.828,224.0083,90.0000,0.0000,46.5325,0,270.0000
MountState,2.834,Parked
CaptureStarting,157.564,1.000,Ha
CaptureStarting,193.005,1.000,Ha
GuideState,1294.960,Disconnected

MountState,1299.878,Error
MountCoords,1301.548,236.5875,90.0000,0.0000,46.5325,0,270.0000
MountState,1301.556,Parked
CaptureStarting,1328.073,1.000,
CaptureStarting,1343.852,0.200,
CaptureStarting,1383.454,0.500,
CaptureStarting,2491.337,0.500,
CaptureStarting,2511.676,1.000,
CaptureStarting,2525.472,1.000,
CaptureStarting,2538.113,3.000,
…
GuideStats,10239.391,0.434,2.826,0,0,46.030,0.000,0
MountCoords,10240.879,210.9542,54.2528,55.7617,71.2778,0,332.9875
GuideStats,10243.895,-1.957,7.471,-116,-597,48.350,0.000,0
GuideStats,10248.744,1.226,2.087,0,-332,37.600,0.000,0
GuideStats,10252.957,0.404,-5.278,0,597,43.510,0.000,0
GuideStats,10257.468,-5.552,-0.769,-331,0,45.390,0.000,0
GuideStats,10261.881,-3.694,-1.622,-230,257,45.410,0.000,0
GuideStats,10266.241,-1.531,0.023,-98,0,38.200,0.000,0
GuideStats,10270.654,-2.201,0.015,-134,0,54.130,0.000,0
GuideStats,10275.159,-1.516,0.602,0,0,34.440,0.000,0
GuideStats,10279.779,-3.557,1.889,0,0,57.520,0.000,0
GuideStats,10284.252,-6.024,2.262,0,0,59.340,0.000,0
CaptureComplete,10288.865,600.000,Ha,1.251,/home/stellarmate/Pictures/Light/Ha/M_101
_Light_Ha_600_secs_2021-04-23T23-14-17_005.fits,247,2036,0.419
GuideStats,10289.268,-3.960,1.340,0,0,40.720,0.000,0

The real coordinates of M101 are RA = 14h 03m 12.6s = 14*15+03*15/60=210.75, EKOS says it took the picture at [210.9542,54.2528] which is technically correct, however, the picture is not in the right place since we can't see M101 and Astrometry.net positions my master at (213.171, 53.901).

We can therefore conclude that even if the EKOS logs are correct, the mount thinks it is in a different place than where it really is.

I then looked for the problem. My log files showed a correct UTC start time compared to the SM-PI4 time. But this time was wrong compared to the Windows local time. I then noticed that my Kstars setting indicated "Kstars updates all devices". I run Kstar on the PI4. So I bought an RTC HAT for the PI4. Since then, the time of the PI4, the windows PC and the GPS are synchronous.



But the lag on my GOTO target continued. I changed my GPSD. The new one works fine, but the lag on my target is still there, even when I ask my mount to synchronize to the GPSD on INDI. If I choose the "GPS updates Kstars" option in Kstars, which would make the most sense at this point, the target offset is still there. I tried to impose "Kstars updates all devices", but EKOS sends me a message asking me to let the GPSD take control. In the end, I only reach my target via an alignment with the plate solver. After that, it works. Until the Meridian Flip. After the Meridian Flip, I have to do the alignment again.

In conclusion, the GOTO doesn't work correctly in the summer time only, so it clearly seems to be related to the way Kstars, EKOS and the EQMod mount driver talk to each other on INDI. The logs do record that I am at UTC+2. But there are one or more of these components that suggest I am at a location that is 2 time zones away from Greenwich, when I am only at one time zone, but with daylight saving time. It seems logical that the confusion could exist, since each component does not have a box to distinguish between daylight saving time and winter time.

Finally, I think I have a complete sequence. The EKOS log file "ekos-2021-05-30T22-32-40 TXT Flip" is created on my windows 10 PC at 00:32 local. In EKOS, the time is 22:32 UTC. At the same time, Kstar creates a file "log_22-32-19" which in my PC, follows the file "log_21-59-11" which ended at 22:32 on my PC.

In the Kstars file it says:

[2021-05-30T22:32:23.684 CEST WARN][org.kde.kstars] - "Object named Hektor (1907 XM) not found"
[2021-05-30T22:32:23.942 CEST DEBG][org.kde.kstars] - Paths to color scheme : ("/usr/share/kstars/themes")
[2021-05-30T22:32:24.272 CEST DEBG][org.kde.kstars] - Reporting new timestep value: 60
[2021-05-30T22:32:24.660 CEST DEBG][qt5ct] - D-Bus global menu: no
[2021-05-30T22:32:24.677 CEST CRIT][default] - Shortcut for action "get_data" "Download New Data..." set with QAction::setShortcut()! Use KActionCollection::setDefaultShortcut(s) instead.
[2021-05-30T22:32:24.707 CEST DEBG][org.kde.kstars] - Daylight Saving Time active
[2021-05-30T22:32:24.707 CEST DEBG][org.kde.kstars] - Next Daylight Savings Time change (Local Time): "Sun Oct 31 00:59:59 2021 GMT"
[2021-05-30T22:32:24.708 CEST DEBG][org.kde.kstars] - Next Daylight Savings Time change (UTC): "Sat Oct 30 22:59:59 2021 GMT"
[2021-05-30T22:32:25.281 CEST DEBG][org.kde.kstars] - Daylight Saving Time active

[2021-05-30T22:32:25.281 CEST DEBG][org.kde.kstars] - Next Daylight Savings Time change (Local Time): "Sun Oct 31 00:59:59 2021 GMT"
[2021-05-30T22:32:25.281 CEST DEBG][org.kde.kstars] - Next Daylight Savings Time change (UTC): "Sat Oct 30 22:59:59 2021 GMT"
[2021-05-30T22:32:25.281 CEST DEBG][org.kde.kstars] - Starting the timer
[2021-05-30T22:32:25.838 CEST DEBG][org.kde.kstars] - Date/Time is: "Sun May 30 20:32:24 2021 GMT"
[2021-05-30T22:32:25.838 CEST DEBG][org.kde.kstars] - Location: "GPS Location"
[2021-05-30T22:32:25.838 CEST DEBG][org.kde.kstars] - TZ0: 1 TZ: 2
[2021-05-30T22:32:25.841 CEST WARN][org.kde.kstars] - Current icon theme is "breeze-dark"
[2021-05-30T22:32:25.917 CEST DEBG][org.kde.kstars] - "Default" :: ""
[2021-05-30T22:32:26.307 CEST DEBG][default] - glibc >= 2.1 detected. Using GNU extension sincos()

So it says that winter time will resume on 31.20.2021, and it sets TZ0:1 TZ:2.
What do these two TZ mean?

Further on, he initializes the GPSD :

[2021-05-30T22:32:39.318 CEST DEBG][org.kde.kstars.indi] - Rigelsys NStep : "[DEBUG] RES <2B 30 30 30> "
[2021-05-30T22:32:39.318 CEST DEBG][org.kde.kstars.indi] - Rigelsys NStep : "[DEBUG] CMD <3A 52 42> "
[2021-05-30T22:32:39.318 CEST INFO][org.kde.kstars.ekos] - "GPSD" Version: "0.5" Interface: 32832 is connected.
[2021-05-30T22:32:39.318 CEST DEBG][org.kde.kstars.ekos] - 2 devices connected out of 3
[2021-05-30T22:32:39.392 CEST DEBG][org.kde.kstars.indi] - < GPSD >: < GEOGRAPHIC_COORD >
[2021-05-30T22:32:39.398 CEST DEBG][org.kde.kstars.indi] - < GPSD >: < TIME_UTC >
[2021-05-30T22:32:39.402 CEST DEBG][org.kde.kstars.indi] - < GPSD >: < GPS_REFRESH >
[2021-05-30T22:32:39.405 CEST DEBG][org.kde.kstars.indi] - < GPSD >: < GPS_REFRESH_PERIOD >
[2021-05-30T22:32:39.413 CEST INFO][org.kde.kstars.indi] - GPSD : "[INFO] GPS fix is in progress... "
[2021-05-30T22:32:39.413 CEST DEBG][org.kde.kstars.indi] - < GPSD >: < GPS_STATUS >
[2021-05-30T22:32:39.419 CEST DEBG][org.kde.kstars.indi] - < GPSD >: < POLARIS >
[2021-05-30T22:32:39.423 CEST DEBG][org.kde.kstars.indi] - < GPSD >: < GPS_TIME_SOURCE >
[2021-05-30T22:32:39.427 CEST DEBG][org.kde.kstars.indi] - < GPSD >: < SIM_GEOGRAPHIC_COORD >

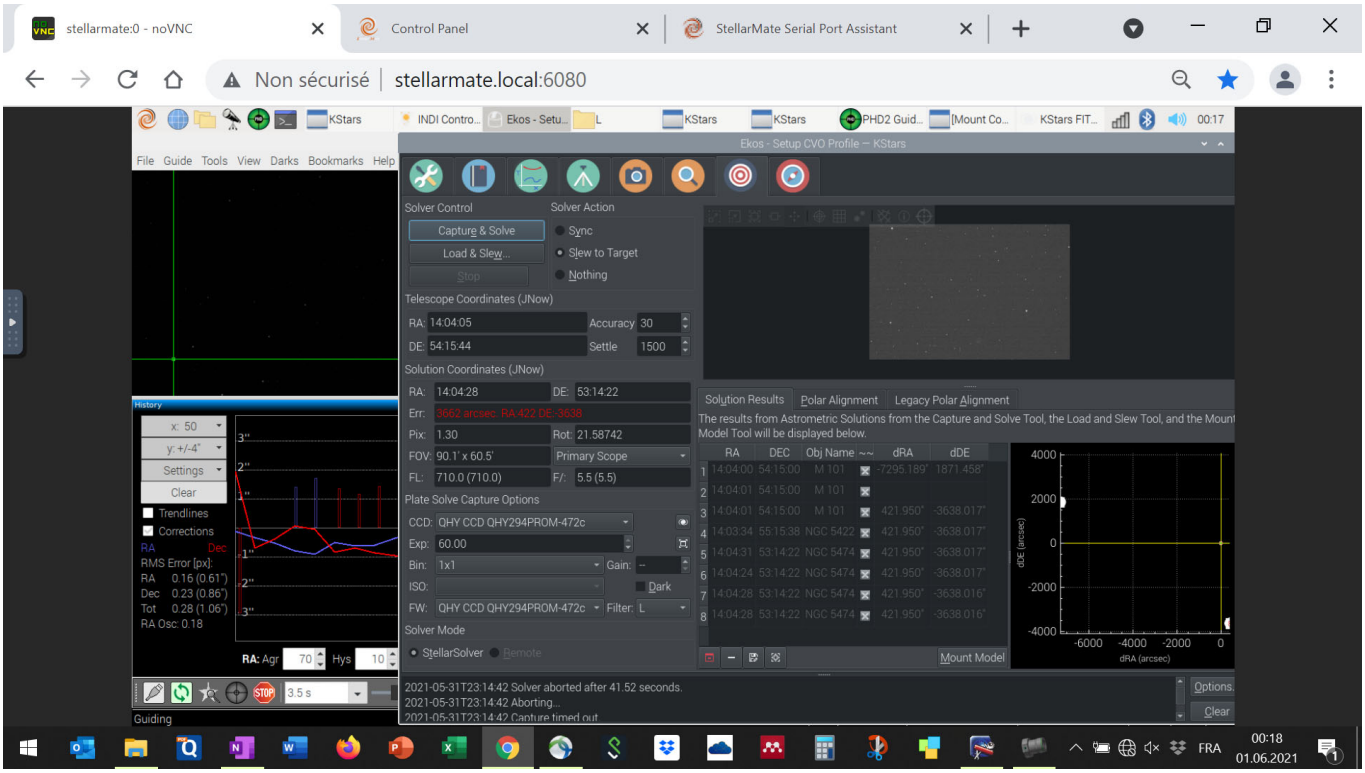
After the focusing:

[2021-05-30T22:46:15.295 CEST DEBG][org.kde.kstars.indi] - QHY CCD QHY294PROM-472c : "[DEBUG] QHYCCD|QHY5IIICOOLBASE.CPP|GetChipCoolTemp|currentPWM = 65.000000 "
[2021-05-30T22:46:15.296 CEST DEBG][org.kde.kstars.indi] - QHY CCD QHY294PROM-472c : "[DEBUG] QHYCCD|QHY5IIICOOLBASE.CPP|GetChipCoolPWM|currentPWM = 65.000000 "
[2021-05-30T22:46:15.296 CEST DEBG][org.kde.kstars.indi] - QHY CCD QHY294PROM-472c : "[DEBUG] CCD T.: -10 (C) Power: 65 (25.49%) "
[2021-05-30T22:46:15.700 CEST DEBG][org.kde.kstars.indi] - Rigelsys NStep : "[DEBUG] CMD <3A 52 50> "
[2021-05-30T22:46:15.738 CEST DEBG][org.kde.kstars.indi] - Rigelsys NStep : "[DEBUG] RES <2B 30 35 30 33 30 30> "
[2021-05-30T22:46:16.059 CEST INFO][org.kde.kstars.indi] - Setting UTC time from device: "GPSD" "Sun May 30 20:46:58 2021 GMT"
[2021-05-30T22:46:16.060 CEST DEBG][org.kde.kstars] - Daylight Saving Time active
[2021-05-30T22:46:16.060 CEST DEBG][org.kde.kstars] - Next Daylight Savings Time change (Local Time): "Sun Oct 31 00:59:59 2021 GMT"
[2021-05-30T22:46:16.060 CEST DEBG][org.kde.kstars] - Next Daylight Savings Time change

(UTC): "Sat Oct 30 22:59:59 2021 GMT"
[2021-05-30T22:46:16.060 CEST INFO][org.kde.kstars.indi] - Setting location from device: "GPSD" Longitude: " 06° 16' 07\"" Latitude: " 46° 31' 58\""
[2021-05-30T22:46:16.062 CEST INFO][org.kde.kstars.indi] - GPSD : "[INFO] GPS fix obtained. "
[2021-05-30T22:46:16.062 CEST INFO][org.kde.kstars.indi] - Setting location from device: "GPSD" Longitude: " 06° 16' 07\"" Latitude: " 46° 31' 58\""
[2021-05-30T22:46:16.063 CEST INFO][org.kde.kstars.indi] - Setting UTC time from device: "GPSD" "Sun May 30 20:46:58 2021 GMT"
[2021-05-30T22:46:16.451 CEST DEBG][org.kde.kstars] - Daylight Saving Time active
[2021-05-30T22:46:16.451 CEST DEBG][org.kde.kstars] - Next Daylight Savings Time change (Local Time): "Sun Oct 31 00:59:59 2021 GMT"
[2021-05-30T22:46:16.451 CEST DEBG][org.kde.kstars] - Next Daylight Savings Time change (UTC): "Sat Oct 30 22:59:59 2021 GMT"
[2021-05-30T22:46:16.455 CEST INFO][org.kde.kstars.indi] - EQMod Mount : "[INFO] updateLocation: long = 6.2687 lat = 46.5327 "
[2021-05-30T22:46:16.457 CEST INFO][org.kde.kstars.indi] - EQMod Mount : "[INFO] Observer location updated: Latitude 46:31:57.7 (46.5327) Longitude 6:16:07.3 (6.2687) "
[2021-05-30T22:46:16.460 CEST INFO][org.kde.kstars.indi] - EQMod Mount : "[INFO] Setting UTC Time to 2021-05-30T20:46:58, Offset 2 "

This last line? Offset 2... From EQMount... Kstars know that this is the Daylight... What about EQMod?

To conclude, the next day I asked for a GOTO to M101, and the system place me here:



3362 arcsec is more or less 1h... Again!

I will try some new test the next days.
Thank you for your collaboration
Best regards
Christian