mngr.check_tramline()

- Take flat and arc frames
- login to aatlxe with the data reduction machine. Open a shell

```
hector@aatlxe:~$ ipython
In [1]: import hector; mngr = hector.manager.Manager('220627_220706')
In [2]: mngr.make_tlm(); mngr.reduce_arc(); mngr.reduce_fflat()
in [3]: mngr.check_tramline()
```

```
In [2]: mngr.check_tramline()
disable files listed in /data/hector/reduction/220627_220706/disable.txt

Note that this task properly works after running mngr.make_tlm(), mngr.reduce_arc(),and mngr.reduce_fflat()

Unfortunately tramline failures are detected.
Open /data/hector/reduction/220627_220706/tlm_failure.txt and follow the steps.
```

```
hector@aatlxe:~$ vi 220627_220706/tlm_failure.txt
```

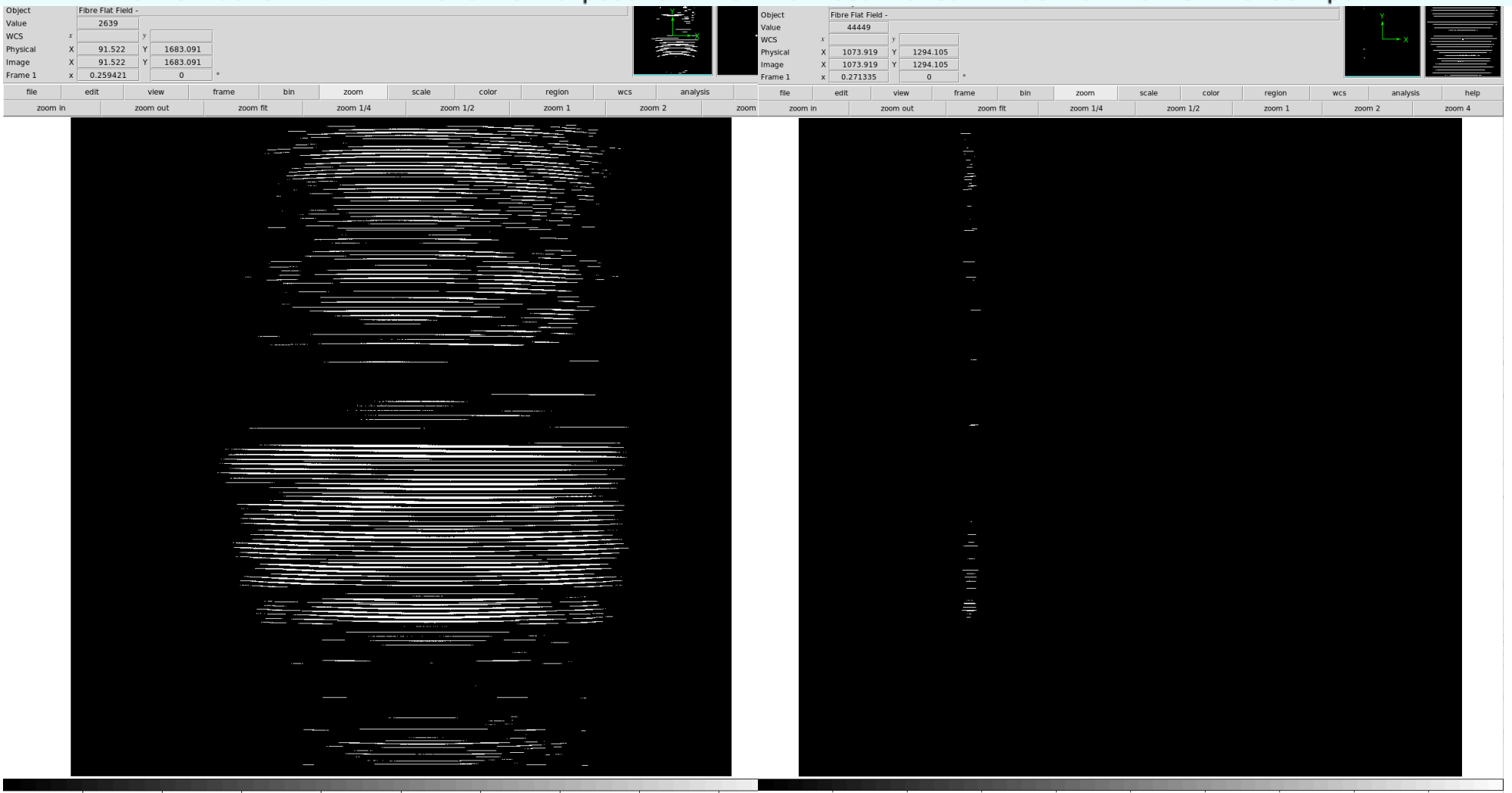
```
26may30004.fits  checked. No failure found.
```

The code checkes tlm failure due to
- saturated frames
- frames which are out of focus
- sky fibres in a wrong position
- tramlne cutoff

Questions? Email to Sree Oh (sreemario@gmail.com)

Check point 1: saturated frames

```
========== 27jun40005.fits: Failure detected ==========
     * Catastrophic failure. Tramline fails for more than 10 fibres.
     Check point: Max count: 65535   Number of saturated pixels: 255802
       Max count reaches to the saturation level. Is it saturated or just cosmic ray?
       Visually check the frame: hector@aatlxe:~$ ds9 /data/hector/reduction/220627_220706/reduced/220627/1/1
_F0/calibrators/ccd_4/27jun40005.fits -scale limits 65000 65100 -zoom to fit&
       If satureted, you should find white horizental line(s).
       If saturated, add 27jun40005 on /data/hector/reduction/220627_220706/disable.txt
       Take new dome flat with shorter exposure time. No need to continue to the next check point.
```

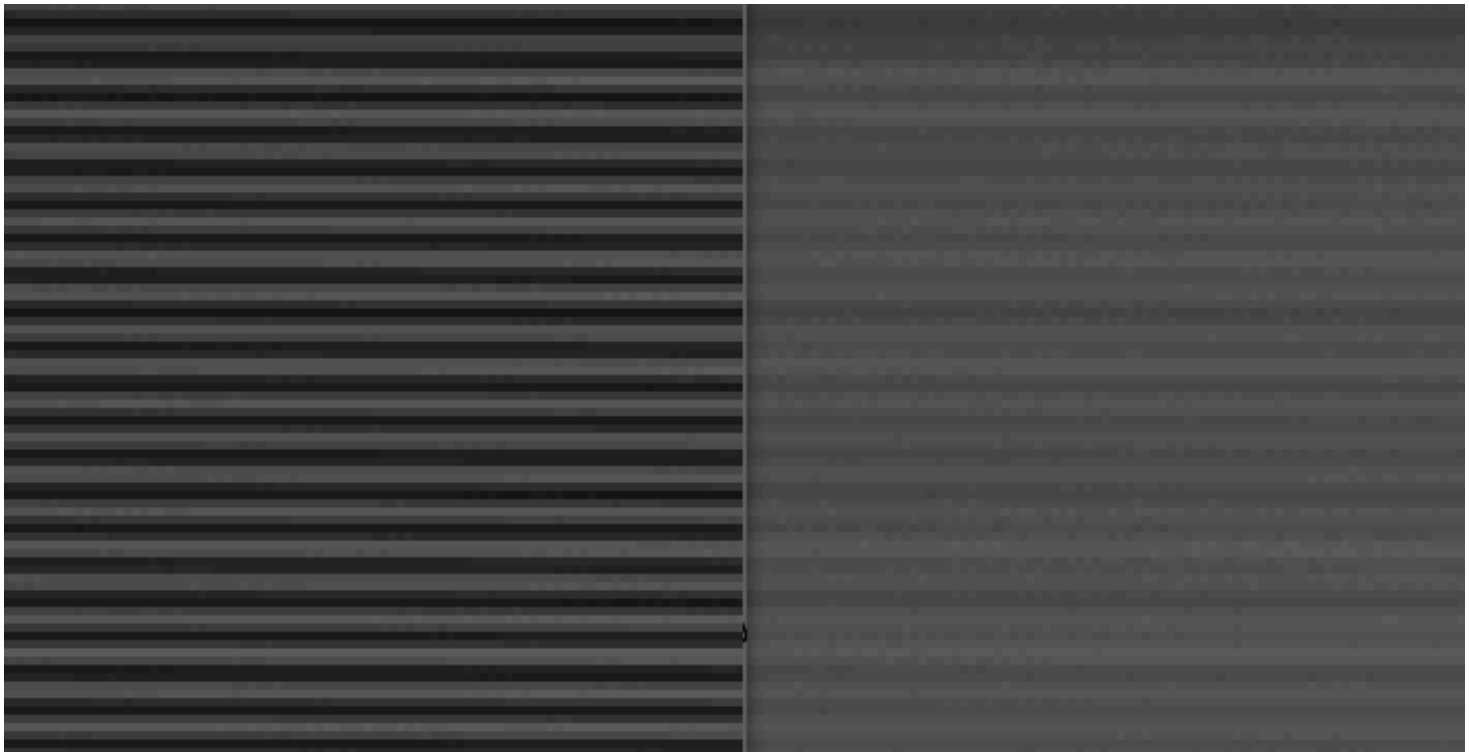


Check point 2: frames that are out of focus

```
========== 28jun30040.fits: Failure detected ==========
     * Catastrophic failure. Tramline fails for more than 10 fibres.
     Check point: This frame is not saturated. Continue to the next check point.
     Check point: visually check the focus: hector@aatlxe:~$ ds9 /data/hector/reduction/220627_220706/reduced
/220628/1/1_F0/calibrators/ccd_3/28jun30040.fits -zoom 4&
       Do you clearly see a contrast (~ 10000 count) between the signal and gap? If not, it is out of focus.
       If it is out of focus, add 28jun30040 on /data/hector/reduction/220627_220706/disable.txt
       You need to add all other (arc, object) frames that are out of focus.
       Do check the focus values. No need to continue to the next check point.
```

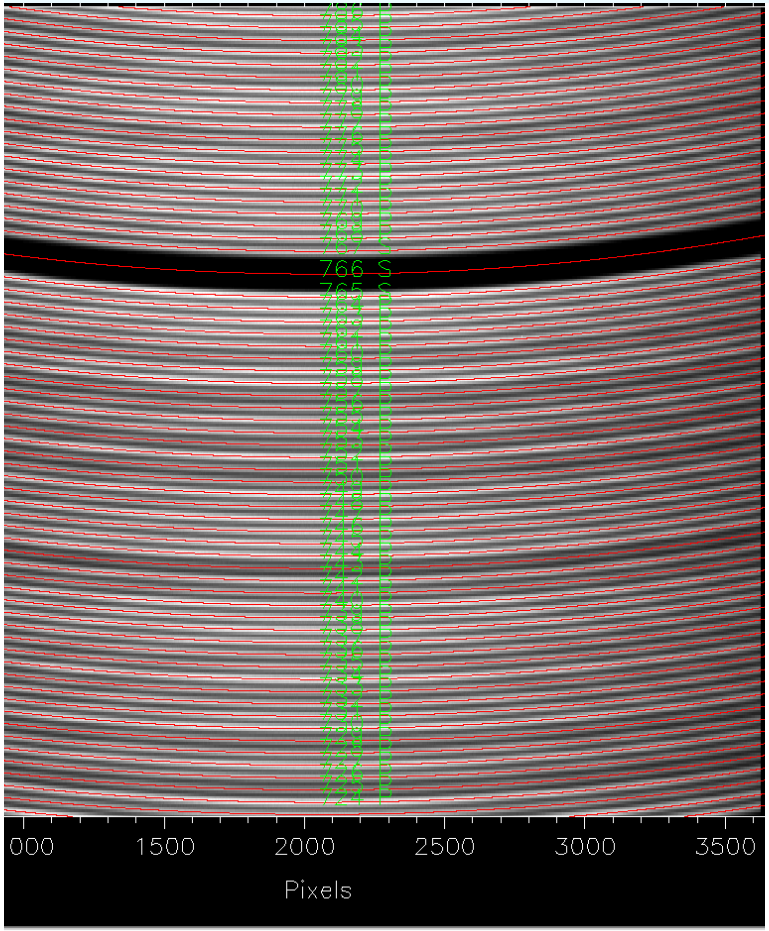
in focus
contrast ~ 10000 counts

out of focus
contrast ~ 2000



Check point 3 - sky fibres in the wrong position

```
========== 29jun30003.fits: Failure detected ==========
     * Fibre 766 is allocated where there is no signal.
     Check point: This is a sky fibre Sky-H2-1. Go to the top-end and check the sky fibre is correctly positioned.
       If the position was wrong, disable them adding 29jun30003 and 29jun40003 on /data/hector/reduction/220627_220706/di
sable.txt
       Take new dome flat with corrected sky fibre position and repeat this analysis.
       If it is too late to take dome flat of the plate, do not add the file to the disable list but add a comment by foll
owing the commond below.
       If you took arc and object frames with a wrong fibre position, add a comment to the frames:
       In the ipython shell    In [1]: mngr.add_comment(["filename"])         e.g. mngr.add_comment(["29jun30003.fits"])
         Please enter a comment (type n to abort):
         position error: sky fibre Sky-H2-1 SPEC_ID=766 TYPE=S
       If the sky fibre position was correct, continue to the next check point
```



active (S) sky fibre 766
is allocated where there is no signal

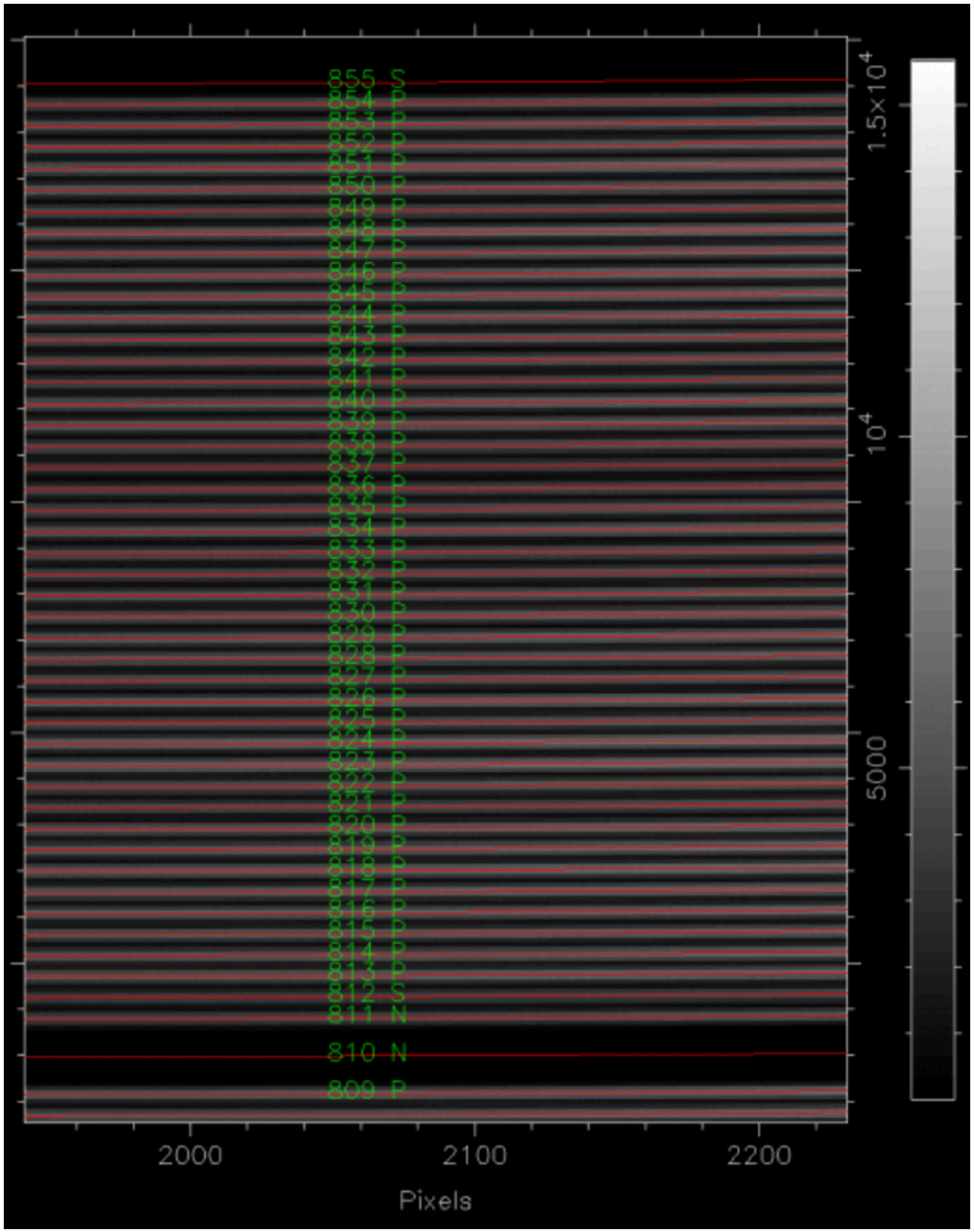
There is a chance that we accidently position
this fibre to position 0

Sometimes all other fibers are well allocated
– active fibres (S, P) have a signal
except a known low thput Fibre 51
– inactive fibres (N) don't have a signal

Sometimes it brings catastrophic error

Do check the sky fibre position twice!
It only takes 1 min

tlm failure casued by the wrong sky fibre position



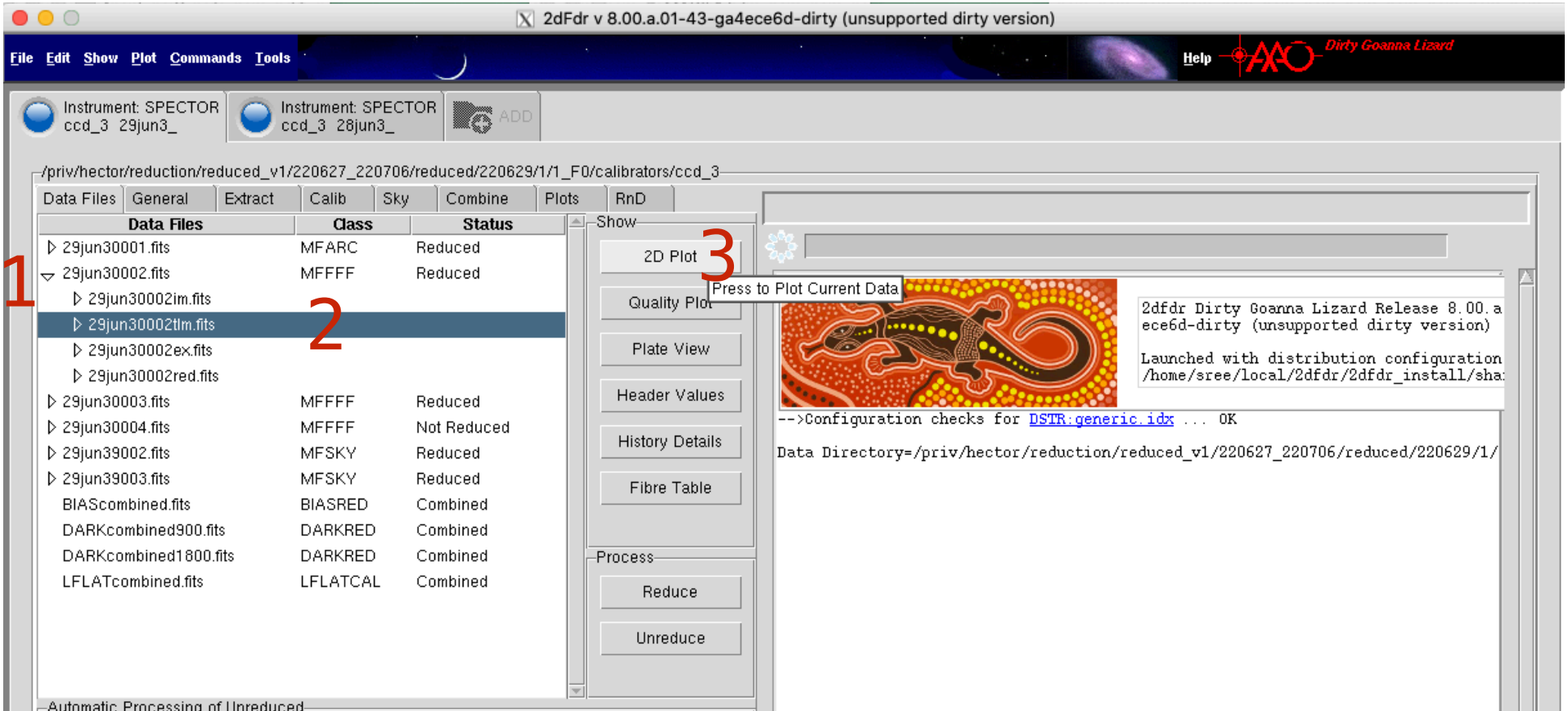
855 S (an active sky fibre)
is allocated where there is no signal

Fibre 360 was incorrectly positioned,
which affected Fibres 811 and 855.

811 N (an inactive fibre)
is also allocated where there is signal

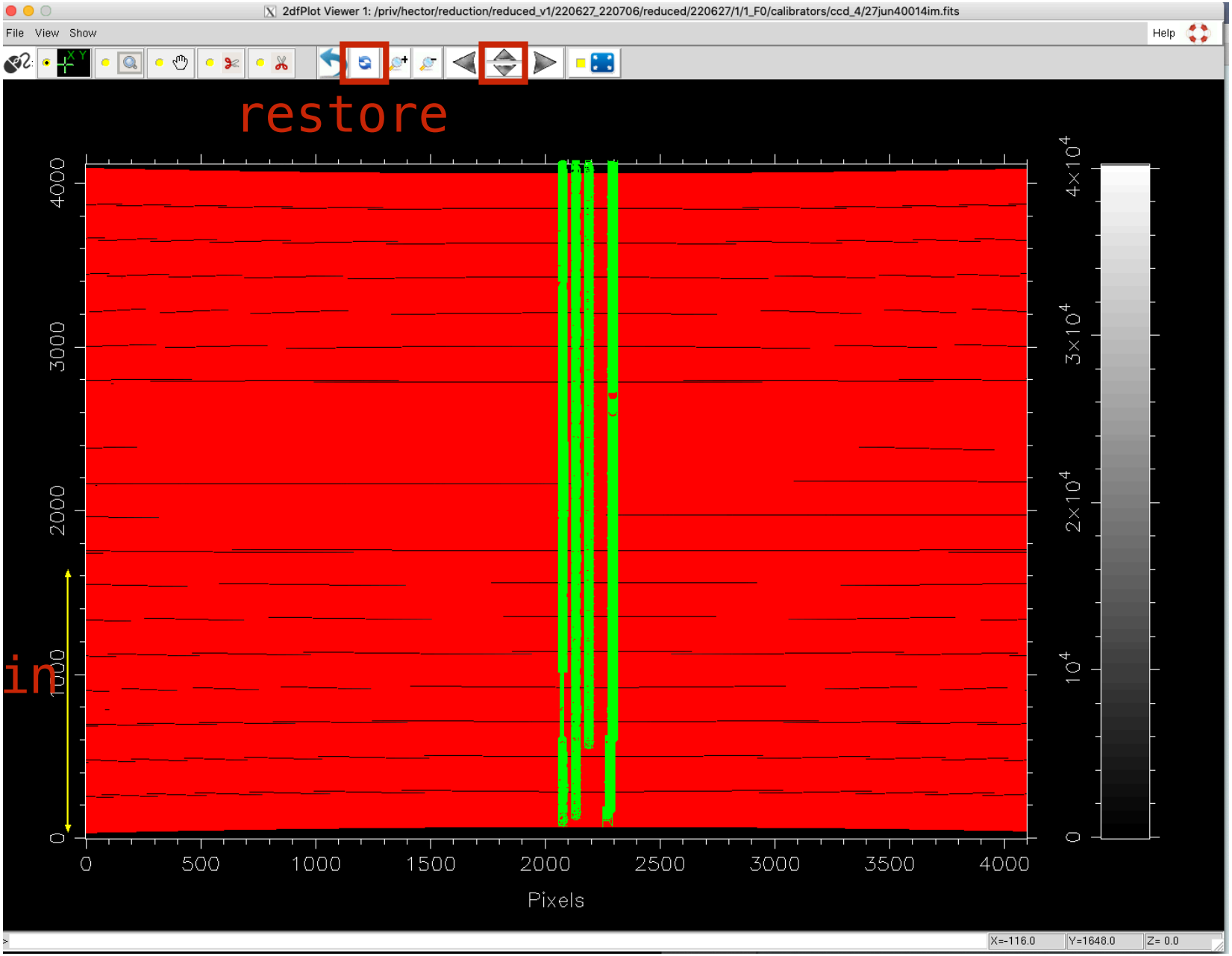
check point 4 - visually checking tlm map

```
    Check point: visually check tlm:
      In the ipython shell    In [1]: mngr.load_2dfdr_gui("/data/hector/reduction/220627_220706/reduced/2
220629/1/1_F0/calibrators/ccd_3")
      When the window pops up, click the triangle symbol by the filename (29jun30002.fits)
      Select 29jun30002tlm.fits, and click 2D Plot button on the middle column.
      In the new window, place your cursor to any y-axis value, click and drag down to zoom in
      Find the fibres listed above and confirm the failure.
      Note that only active fibres (P, S) are supposed to have a signal except Fibre 51. Inactive fibres
(N, U) should not have a signal.
      Once the failure is confirmed, you immediately report this to Sree Oh (sree.oh@anu.edu.au), Madusha
 Gunawardhana (madusha.gunawardhana@sydney.edu.au), and Scott Croom (scott.croom@sydney.edu.au) and also s
end the raw file (29jun30002.fits) and this text file (flm_failure.txt).
      It may require a modification of 2dfdr, which takes some time. You may take another dome flat with
different exposure time and telescope pointing. If failed again, try a flap flat.
```



check point 4 - visually checking tlm map

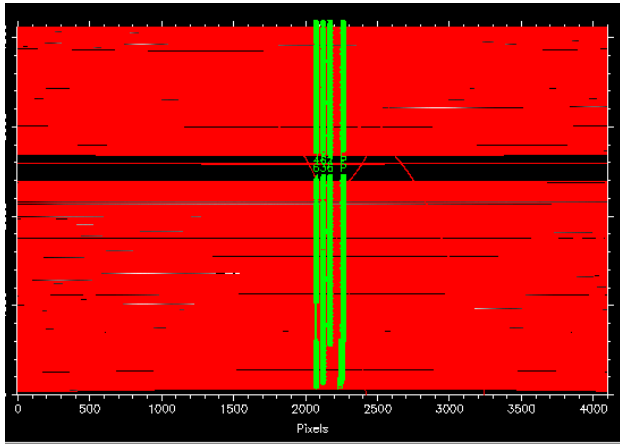
move up, down



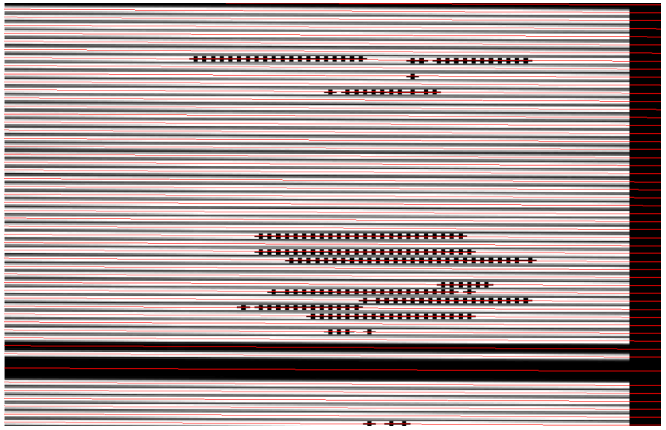
zoom in

example tlm failures

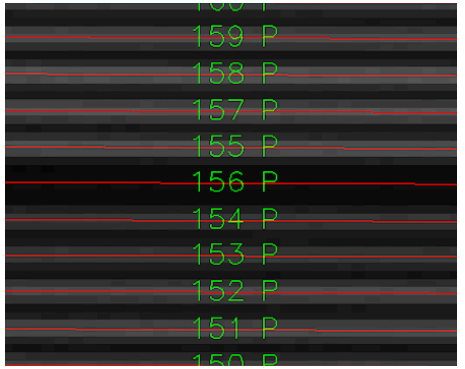
catastrophic failure



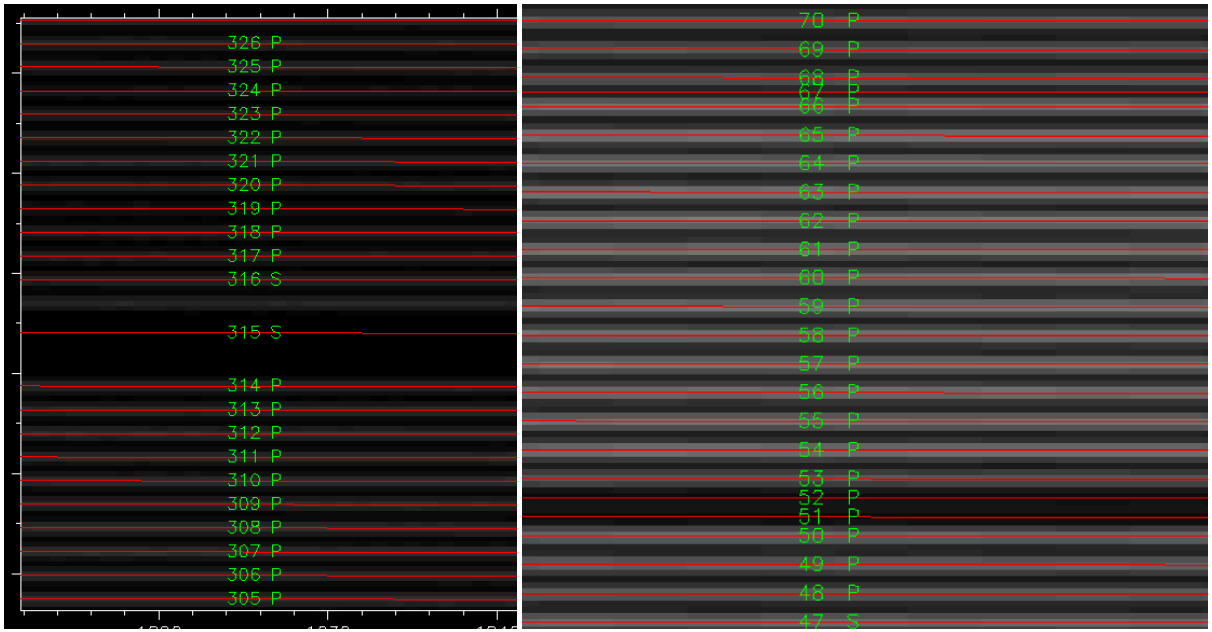
saturated



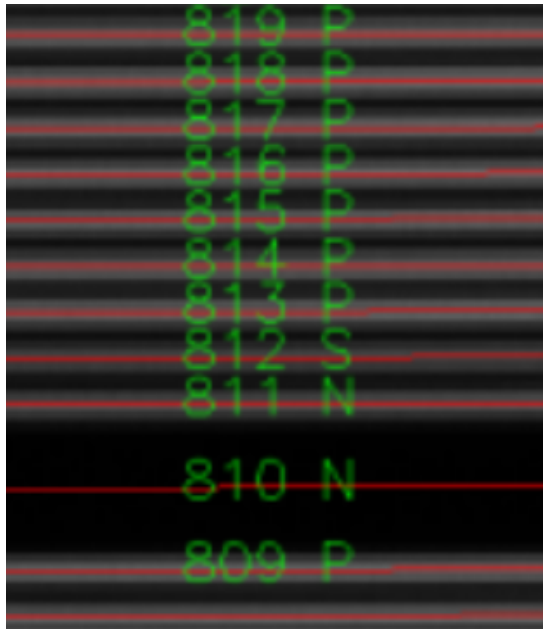
not in numerical order
(154–156–155)



active fibres (S, P)
allocated where there is no signal

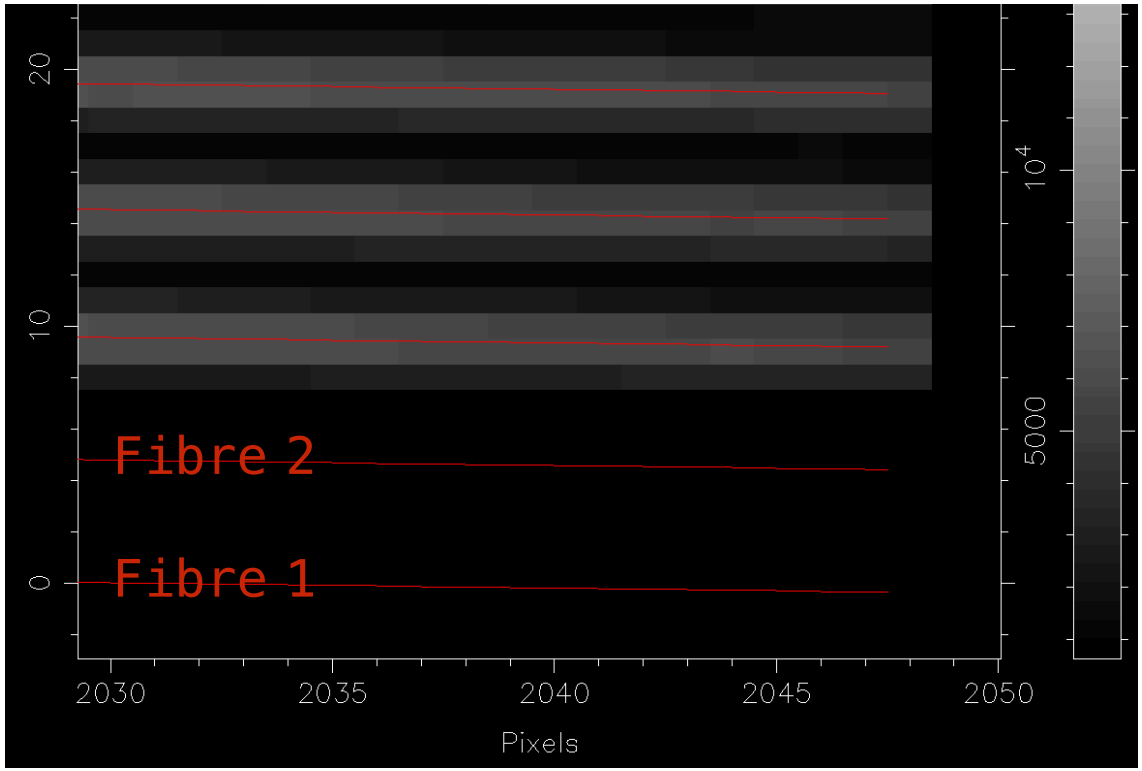


inactive fibres (N, U)
allocated where there is signal



check point 5 - the cut-off of tramline

```
========== 28jun40028.fits: Failure detected ==========
     * Fibre 1 shows cut off of tramline at the bottom right corner.
     Check point: This frame is not saturated. Continue to the next check point.
     Check point: check how the other arm (28jun30028) is doing. You may find a solution there.
     Check point: visually check tlm:
       In the ipython shell    In [1]: mngr.load_2dfdr_gui("/data/hector/reduction/220627_220706/reduced/220628/1/1_F0/calibrators/ccd_4")
       When the window pops up, click the triangle symbol by the filename (28jun40028.fits)
       Select 28jun40028tlm.fits, and click 2D Plot button on the middle column.
       In the new window, place your cursor to any y-axis value, click and drag down to zoom in
       Find the fibres listed above and confirm the failure.
       Note that only active fibres (P, S) are supposed to have a signal except Fibre 51. Inactive fibres (N, U) should not have a signal.
       Also, visually check the bottom right corner. The Y position of the tramline of Fibre 1 should be between 2 and 4110.
       If this is not a result of tramline failure, and the cut-off of tramline is confirmed, ask site staff immediately to adjust the mou
nting of the slit on SPECTOR ccd_4.
       They stay until 4 pm. If it is too late, resolve this the next day and add a comment to the ccd_4 frames of the day:
       In the ipython shell    In [1]: mngr.add_comment(["filename"])         e.g. mngr.add_comment(["28jun40028.fits"])
         Please enter a comment (type n to abort):
         tlm cutoff: fibre 1 at the bottom right corner
```



tramline of Fibre 1
(the bottom most red line)
is positioned below 2 in y value

Note that Fibre 1 is blocked for AAOmega (ccd_1 & ccd_2), and Fibre 2 will be used for checking tlm cut-off.