

# Observation with FEROS – A short recipe

Observing with FEROS is really not difficult.

In order to guarantee a nice observing period without complications, I'll try to find the answers to the questions, which I had before the first observing run with FEROS:

## **1. What shall I do when I arrive?**

I'm not sure, if you have been there before, but when I arrived at La Silla, I went to the observation building NOB and talked to the day astronomer about basic things like problems in the nights before and so on.

Afterwards I prepared everything for the first night, namely the p2pp OBs. That brings me to the next question.

## **2. What shall I do with the OBs for p2pp?**

OBs are provided by the PI before the run. Either they have been submitted to the telescope already beforehand using p2pp (mark the prepared OBs, click “file” --> check-in), which is the best solution or you (the observer) will bring them on an own laptop, ideally as attachment to an email to the observatory. In this case they have to be imported to p2pp locally as follows: Go to the p2pp-impex folder on the computer No.3 (see figure 1). With a left click on the desktop surface, you open a new terminal by choosing “visitor on w2p2dhs” from the drop down menu. Go to the directory “/diska/home/visitor” and see if there is a folder named after the PI. If not create one. Then start firefox from the terminal by typing “firefox &”, go to your email account (e.g. the MPIA page) and download the Obs into the new folder, at best in a subdirectory indicating the corresponding proposal ID.

Now go to the desktop “P2PP” and see if there is still an active p2pp session.

If yes, press “file” → > ”login as” and log in with the account data of the PI (because then he/she will have access via the ESO archive after the observation).

Import the downloaded OBs into the correct proposal ID folder in p2pp on the left side of the window.

## **3. What daytime calibrations are needed for FEROS?**

Usually the day astronomer already started the afternoon calibration when you arrive. This is fine. In case he/she didn't do it, you can tell him/her then. Afterwards you have enough time to have some breakfast etc. When you come back, you can check the result of the calibration. The calibration is done on the computers No. 1 & 2. Ok, to be more precise, it's screen No.1 and 2 because they are connected to the same machine.

You can see if the calibration is finished, by looking for a browser pop-up window on this screens (figure 3, below). After finishing, 4 tabs will be available in this window.

Please take care not to mix up the different dates (2 of them are pretty old, from 2005, I

think just for comparison). The most left one with the right date is the calibration for ThAr. The result for this is not that important, because it is not used for data reduction. The other window is really important. It is the calibration with ThAr+Ne. This is used for data reduction.

Please check the alignment of the orders and the rms for the two different fibers. (Fiber 1: Object, Fiber 2: Calibration). The rms must be much better than  $5 * 10^{-3}$  Angstrom, otherwise it is a really bad calibration. If the calibration is fine, then enjoy the last hour(s) before sunset.

#### **4. What shall I do, if the calibration is bad?**

Sometimes it happens that the orders are misaligned and/or the rms is pretty bad. Usually you just go to the day astronomer and tell her/him. The normal way is to repeat the calibration and usually afterwards, everything is pretty fine.

PLEASE NOTE: if it is winter in Chile the night starts very early. Since the calibration last about 2.5 hours, you shouldn't get up too late, in order to guarantee a successful repetition of the calibration, just in case!

#### **5. The night begins, what to do?**

The good things about spectrographs is that you do not have to care about twilight flats or whatever. You just tell the night astronomer that you want to observe with FEROS and he/she will do everything that is necessary: pointing, focussing, etc.

You basically just start p2pp with the PIs login data, mark the OB you want to observe by clicking on it with the left mouse button and tell the night astronomer that he/she can fetch the OB. All OBs should have finding charts prepared as well as visibility charts. This will make the planning and execution of the observation much easier. Using the finding charts, the correct object can be centered to the object fibre by the night astronomer. If it is a stormy night and/or the seeing is bad, you should sometimes take a glance at screen of the guiding, where you can see, if the object is still centered on the fiber.

After the exposure you can check the number of counts on a screen, the night observer uses usually. Just tell him/her that you want to see it and you can.

The raw spectrum is now automatically sent into the data reduction and will be reduced with your daytime calibration.

Then you chose the next OB and so on.

In case it is cloudy, windy or a night with bad seeing (DIMM seeing  $> 1.5$  arcsec) it is usually advisable to increase the exposure time significantly (e.g. by a factor of 50%).

#### **6. What to do with the reduced data?**

Usually on the next day you deal with the reduced data. They are stored on the machine of screen No.1,2. In /data/reduced/FEROS/yyy-mm-dd. Before you can copy them to your computer (via rsync or scp), you have to convert them from the midas format .bdf

to the fits format .mt, since the MIDAS format is not portable and therefore useless at home. For this you the midas routine “nightconvert.prg” that is stored in the folder /data/reduced/Visitor/Mohler. (Furthermore, they might be other procedures available in the meantime. Just check with the astronomers on-site.)

Ok, step by step: 1. click on screen 2 on the task bar on “Visitor”. Then click left on the (now almost empty) desktop surface and choose “astro on w2p2off”. You will get a terminal. Then try to find the folder “/data/reduced/Visitor/Mohler”. If it is not there, create it, start firefox, download nightconvert.prg into the folder. If it is there, check if nightconvert.prg is still in there.

Now the execution of the conversion:

- 1 start midas (inmidas -p xx (with xx between 11 and 99))  
It is REALLY important to not forget -p XX, because otherwise you will crash the online pipeline!!!!
- 2 use the script nightconvert.prg  
type in midas: @@ nightconvert  
then give the answers to the question.  
To answer the filename it is really a help, if you wrote the framenumbers down the night before. Just look on the main DRS window (the one on screen 2, the figure 3 below) and look into the filelist in the upper left. There is a list of all the frames that have been taken with FEROS that very night. You'll find lots of calibration files but the object files as well. Just write down the number in front of the object files like fXXXX.mt. XXXX are the numbers the program expects. Just give the smallest (earliest) and the largest (latest) into the program.
- 3 Now you should have a folder with the date you wanted to convert in the folder “/data/reduced/Visitor/Mohler”. Just check if there are several folders called “feroXXXX” in there. If yes, put the in a tar.gz archive.
- 4 Now copy the data to your computer. That is fairly easy, if you brought one with a Linux or Mac system. I never did it with a Mac, so here just the instruction for doing it with Linux. You have to make sure that sshd is installed on your laptop. If not, just install it with “sudo apt-get install sshd” and you will get it. Now, type “ifconfig” in a terminal on your laptop. Check out the inet adress from eth0. Then copy the data from the data computer to your laptop like this: “scp folder.tar.gz [maren@134.171.85.204](mailto:maren@134.171.85.204):/home/maren/FEROS”. Of course you have to update path and username.  
**PLEASE MAKE SURE THAT YOU ARE CONNECTED TO THE INTERNET WITH ONE OF THE BLUE CABLES! OTHERWISE IT WON'T WORK!**

## **7. Do I have to write a report or something?**

Yes, you have to. For this is enough, if you can write down for every night when you observed which program with what instrument.

Sometimes a colorful table is quite helpful. In the end you write a short report for Roland Gredel, including this table and counting, how many hours you observed for which program, how many were lost due to weather or technical loss or GROND interruptions. That's it.

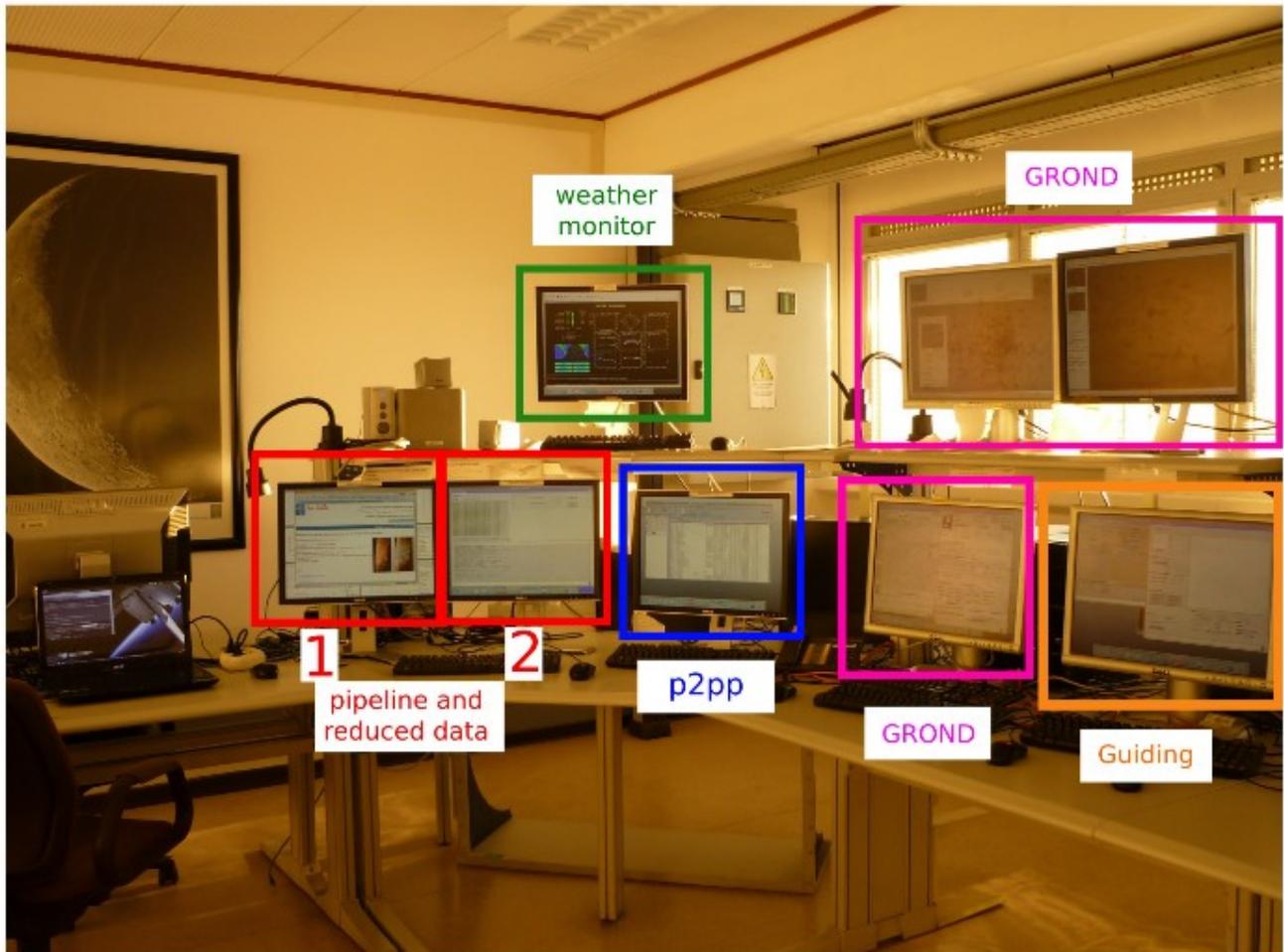


Figure 1: Different screens

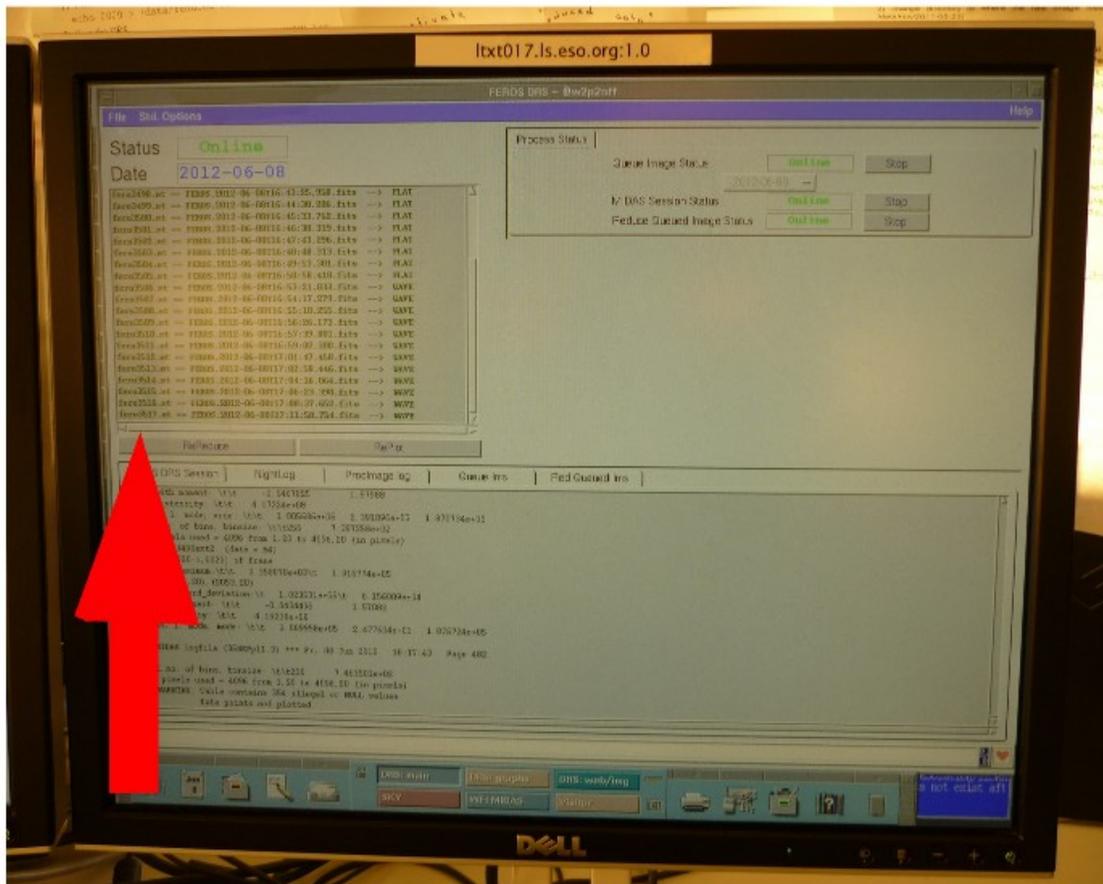


Figure 2: FEROS Midas data reduction system

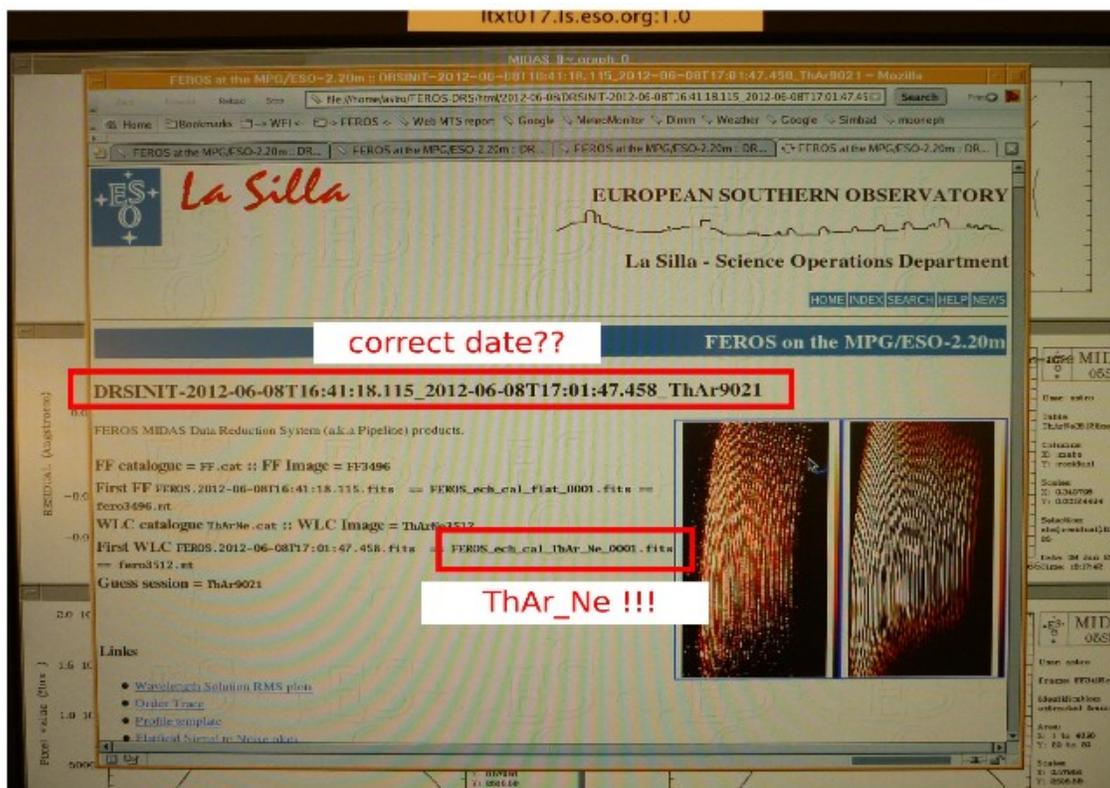


Figure 3: Browser window including DRS results