Dear Greg,

I send you the programs I use to take data with our laser setup and to analyze them.

You will see that we worked with the idea “never change a winning team”.

Thus, the directory Marvin used and handed over to me has still the name “greg”

(greg/data, greg/filter, greg/ctlab). A lot of code will be very familiar with you.

However, this means that we still (have to) work with **Root 5**, since Root 6 demands

“proper C++”. One could update the code in this sense, yet it was not done, since it works.

I will write you the sequence of data taking and analysis, and you can tell me if you needed more.

Data taking:

* You call **filter\_input\_220918.sh** to initialize the measurement and give the proper name (built out of the parameters written)
* This starts data taking with the shell script

**filter\_work\_220918.sh** that gives the positions and step sizes for the motor movement and calls the program

**“moni.cc”** or now “**moni\_max\_fast\_info\_test\_Hang\_Georg\_Test**”

* + - and starts the same time the shell script **filter\_220918.sh** that moves the motors
* **New is,** that **the program “moni” searches for a maximum position and gives this back to the motor steering script.**

The file for the data taking “moni\_max\_fast\_info\_Hang.cc” has to be compiled as follows:

g++ moni\_max\_fast\_info\_Hang.cc calib\_ct\_lab.cxx serial\_line.cxx -o moni\_max\_fast\_info\_test\_Hang\_Georg\_Test

--- **filter\_input\_220918.sh**---

* #!/bin/sh
* #source /u/pandadrc/.bashrc
* #. /home/greg/.bashr
* d=`date +%y%m%d`
* echo $d
* echo ""
* echo ">>>>>>>>>>>>>>>>>>>>>>>> Start at: `date +%Y.%m.%d-%H:%M:%S`"
* echo ""
* filter\_work\_220918.sh IR Nikon 3 faces 442 $d 117.15

---**End** of filter\_input\_220918.sh ----

--**filter\_work\_220918.sh** ------------

#!/bin/sh

#source /u/pandadrc/.bashrc

#. /home/greg/.bashrc

echo DATE $6

skill moni\_max\_fast\_i

skill moni\_max\_fast

echo -1 -666 -666 > /tmp/filter.dat

sleep 60

/u/pandadrc/georg/ctlab\_gs/moni\_max\_fast\_info\_test\_Hang\_Georg\_Test matrix &

#(all x,y values has to be multiplied by 10)

# diode scan diode Brewster position "Bar scan" (only for itterations) "Bar position" diode pure position (-half scan width) mirror-brewsterangle-mot5

#filter.sh x\_width y\_width xy\_step x\_ref y\_ref xb\_width yb\_width xyb\_step xb\_ref yb\_ref x\_pure\_once y\_pure\_once

#442nm

#====================

filter\_220918.sh 50 50 5 110 2090 60 200 20 650 1380 1980 2100 $7 # Nikon 3 faces IR new for series shorter

echo -666 > /tmp/filter.dat # end moni\_ct

sleep 2

echo -1 > /tmp/filter.dat

mv -v $HOMEGREG/ctlab/moni\_ct.dat $HOMEGREG/data/$1\_$2-$3\_$4\_$5nm\_$6\_1.dat

mv -v $HOMEGREG/ctlab/moni\_ct2.dat $HOMEGREG/data/$1\_$2-$3\_$4\_$5nm\_$6\_2.dat

mv -v $HOMEGREG/ctlab/moni\_ct3.dat $HOMEGREG/data/$1\_$2-$3\_$4\_$5nm\_$6\_3.dat

mv -v $HOMEGREG/ctlab/moni\_ct4.dat $HOMEGREG/data/$1\_$2-$3\_$4\_$5nm\_$6\_4.dat

echo ""

echo ">>>>>>>>>>>>>>>>>>>>>>>> Stop at: `date +%Y.%m.%d-%H:%M:%S`"

echo ""

---------------**End of filter\_work\_220918.sh** --------------------

The output files are as follows (after the run they are renamed from **moni\_ct.dat** to the specific name you gave in filter\_input\_220918.sh):

Example: IR\_Nikon-11\_faces\_442nm\_230322\_1.dat

13.9236 1.84149 1.50045 0 0 65 138

13.9236 1.84432 1.49195 0 0 65 138

13.9236 1.81853 1.50557 0 0 65 138

13.9236 1.83111 1.51421 0 0 65 138

13.9236 1.84778 1.491 0 0 65 138

13.9236 1.80721 1.48943 0 0 65 138

13.9236 1.81067 1.49069 0 0 65 138

13.9236 1.82451 1.48408 0 0 65 138

13.9236 1.81853 1.50941 0 0 65 138

13.9236 1.8135 1.51165 0 0 65 138

13.9572 1.84778 1.52606 2 2 65 138

13.9572 1.86074 1.51742 2 2 65 138

With time, value-diode, reference-diode, temperature (not measured, thus placeholder 0 or 2), filter (0 for “bar out” and 2 for “bar in”), bar-x position, bar y-position. The values are measured 10 times each.

These values represent the Maximum value on the diode after it was scanned over the laser-spot.

The data files “Name”\_2.dat, “Name”\_3.dat“, and Name”\_4.dat are used only to analyze the correctness of the diode scan.

Using Root 5:

This file IR\_Nikon-11\_faces\_442nm\_230322\_1.dat is than converted to a root file via the program “glasstest.cc

**root glasstest.cc'("IR\_Nikon11\_faces\_442nm\_230322\_1.dat")'**

and gives the out put file IR\_Nikon11\_faces\_442nm\_230322\_1.root

This again is analyzed in Root5 with matrix.cc

**.x matrix.cc("IR\_Nikon-11\_faces\_442nm\_230322\_1",442,0,0,0,0,true)**

and gives the out put file IR\_Nikon11\_faces\_442nm\_230322\_1\_plot3D.root

The parameter given to “matrix.cc” are the wavelength, that changes the mirror correction and the boundaries x\_min, x\_max, y\_min, and y\_max of the matrix that are used for the determination of the transmission. With the value “true” and “false” choose between internal reflection and bulk absorption.

The output of matrix.cc is also a plot of the voltage values of the diodes and the transmission values of the matrix.

Please ask, if I missed to explain something or to send a file.

Best regards,

Georg