Measurement with tunable excitation energy

1. Turn on Hamamatsu spectrometer, Standa filter, Picoquant (or other) excitation source and trigger. Via usb plug in Arduino control board, Standa filter controller and StarLabs power meter.
2. Open hamamatsu PMA software, select configuration “External”. In “Measurement” select auto save data function and configure the destination.
3. Open Spyder python interface. Configure the starting point and the ending point in the user section of the code:

# USER SECTION  
*start\_point = 0 #min 0  
end\_point = 10 #max 33  
exposure\_time = 1 #seconds same as Hamamatsu!!  
averaging = 1 #same as Hamamatsu!!  
series\_name = 'Rubrene'  
excitation\_wavelength = 0 #index: 0 - '640nm', 1 - '220nm', 2 - '1064nm', 3 - '532nm', 4 - '370nm', 5 - '730nm'  
ophir\_range = 0 #index: 0 - 'AUTO', 1 - '300mW', 2 - '30.0mW', 3 - '3.00mW', 4 - '300uW'  
ophir\_filter =   
destination\_folder = r'C:\Users\Domantas-FNI\Desktop\test' #has to be the same as in hamamatsu software!!*

*start\_point* and *end\_point* configures the total measurement count. Each point represents a different filter combination. Full list of combinations can be found in Table 1.

*exposure\_time* and *averaging* are used for the trigger cycle. Make sure they are the same as in Hamamatsu software! These settings also appear in filename.

*series\_name* is the name of the measured sample

1. Run initialization code. This can be done by selecting the first block (blocks are separated by #%%) of *motor driver control.py* and pressing *“shift + enter”.*
2. Run the next block, “Measurement settings I”. This will move the filter to user defined starting point and allows to set the exposure time in PMA software.
3. Transfer the exposure time and averaging from PMA to “Measurement settings II”. Configure Ophir parameters and destination folder. Run the block.
4. Finally, run the last block to start the measurement.

Table Filter combination list.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Position | wheel1 | wheel2 | f1 | f2 | total |
| 0 | 0 | 0 | 1 | 1 | 1 |
| 1 | 2 | 0 | 0.9 | 1 | 0.9 |
| 2 | 0 | 2 | 1 | 0.8 | 0.8 |
| 3 | 2 | 2 | 0.9 | 0.8 | 0.72 |
| 4 | 3 | 0 | 0.5 | 1 | 0.5 |
| 5 | 3 | 2 | 0.5 | 0.8 | 0.4 |
| 6 | 0 | 3 | 1 | 0.3 | 0.3 |
| 7 | 2 | 3 | 0.9 | 0.3 | 0.27 |
| 8 | 3 | 3 | 0.5 | 0.3 | 0.15 |
| 9 | 4 | 0 | 0.1 | 1 | 0.1 |
| 10 | 4 | 2 | 0.1 | 0.8 | 0.08 |
| 11 | 0 | 4 | 1 | 0.03 | 0.03 |
| 12 | 2 | 4 | 0.9 | 0.03 | 0.027 |
| 13 | 3 | 4 | 0.5 | 0.03 | 0.015 |
| 14 | 5 | 0 | 0.01 | 1 | 0.01 |
| 15 | 5 | 2 | 0.01 | 0.8 | 0.008 |
| 16 | 4 | 4 | 0.1 | 0.03 | 0.003 |
| 17 | 2 | 5 | 0.9 | 0.003 | 0.0027 |
| 18 | 3 | 5 | 0.5 | 0.003 | 0.0015 |
| 19 | 6 | 0 | 0.001 | 1 | 0.001 |
| 20 | 6 | 2 | 0.001 | 0.8 | 0.0008 |
| 21 | 6 | 3 | 0.001 | 0.3 | 0.0003 |
| 22 | 2 | 6 | 0.9 | 0.0003 | 0.00027 |
| 23 | 3 | 6 | 0.5 | 0.0003 | 0.00015 |
| 24 | 7 | 0 | 0.0001 | 1 | 0.0001 |
| 25 | 7 | 2 | 0.0001 | 0.8 | 0.00008 |
| 26 | 4 | 6 | 0.1 | 0.0003 | 0.00003 |
| 27 | 2 | 7 | 0.9 | 0.00003 | 0.000027 |
| 28 | 3 | 7 | 0.5 | 0.00003 | 0.000015 |
| 29 | 5 | 6 | 0.01 | 0.0003 | 0.000003 |
| 30 | 6 | 6 | 0.001 | 0.0003 | 3E-07 |
| 31 | 7 | 6 | 0.0001 | 0.0003 | 3E-08 |
| 32 | 7 | 7 | 0.0001 | 0.00003 | 3E-09 |
| 33 | 1 | 1 | 0 | 0 | 0 |