Appendix F

Lucky Processing quickstart

This document describes how to use Lucky Processing

F.1 Quickstart

The procedure to run Lucky Processing is as follows:

1. either:
   (a) Place the files and folders as shown on section 5.3.2
2. install Python
3. install required packages in the work folder in Python with `pip install -r requierments.txt`
4. change the filename and file path in `flat_proc.py` and `functions.py`
5. either:
   (a) **Preffered:**
      i. input `flat_proc.py`
      ii. input `python main_focus.py`
      iii. input `python main_defocus.py`
   (b) or:
      i. run python in the work directory
      ii. input `import flat_proc` (this will process the flat frame)
      iii. input `import functions as fnc`
      iv. input `fnc.lucky_process_focus()` (this will run the process on focused images)
      v. input `fnc.lucky_process_defocus()` (this will run the process on defocused images)

It is recommended to only run the program on a few frames and display the output in order to dial in the parameters. It is possible to start at any point of the process as long as the previous steps were already performed.

Display can be coded inside `Lucky_process` or using `compare.py`

F.2 Processing examples

F.2.1 Running Lucky Processing from the command line

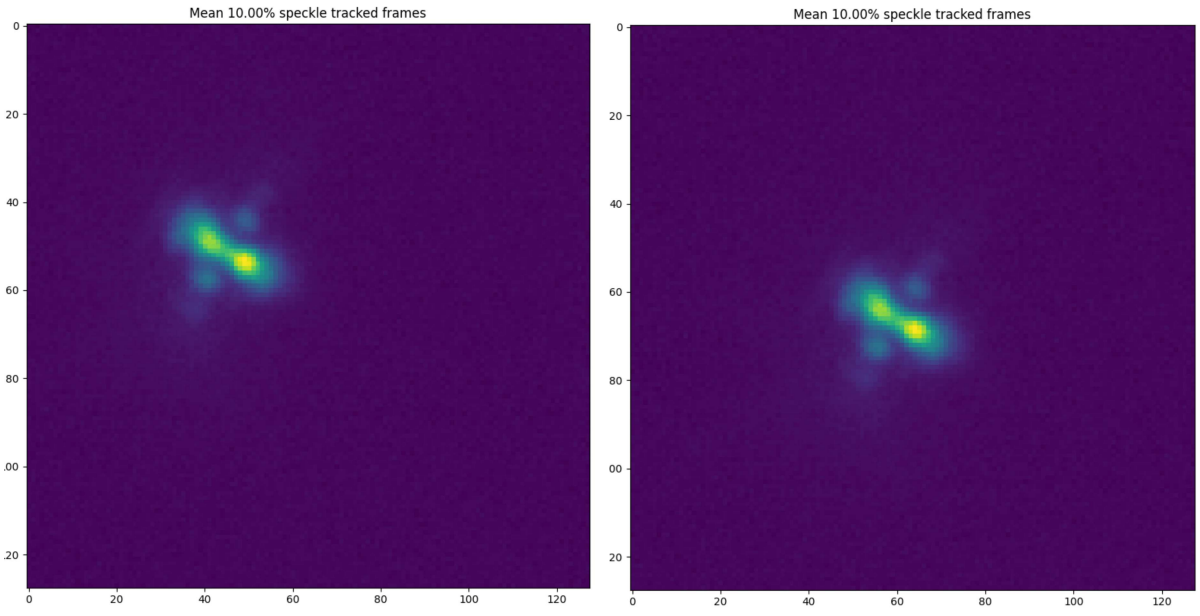
In a terminal, in the correct folder:

```
flat_proc.py
python main_focus.py 1 10        # Correct the ROI in functions.py
python main_focus.py r = 0.01    # process the whole batch and selects the 1%
    best frames
python main_defocus.py           # process the whole batch
```

F.2.2 Running Lucky Processing from the command line in Python

In a terminal, in the correct folder:

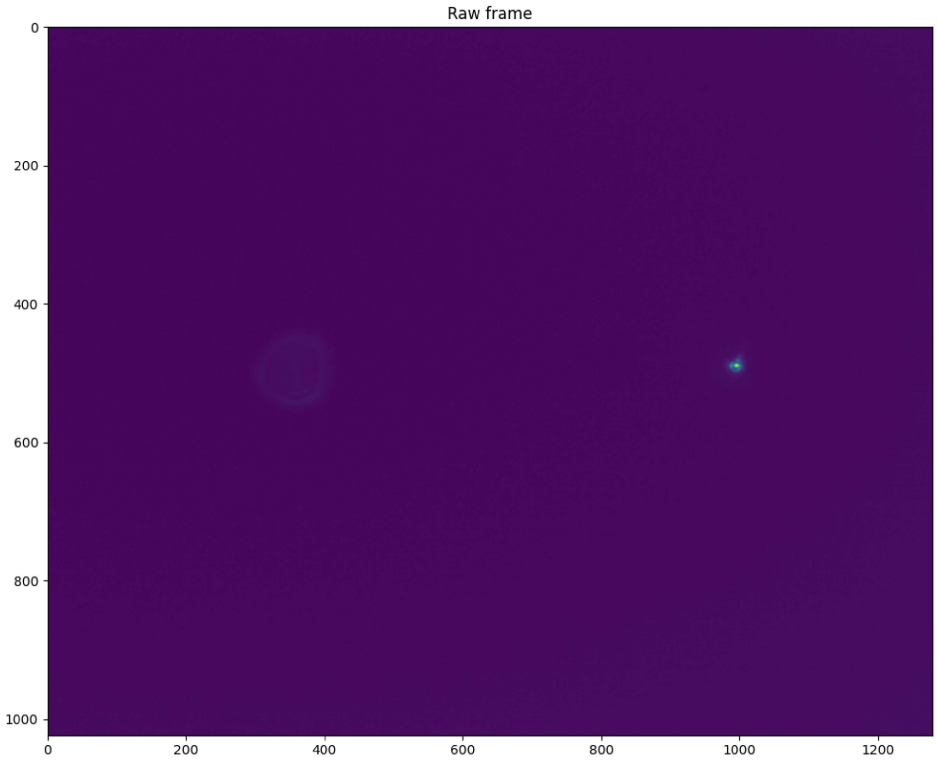
```
py # Start python
import flat_proc
import functions as fnc
fnc.lucky_process_focus(1, 10)
exit()                                  # Correct the ROI in functions.py
py # Start python
import functions as fnc
fnc.lucky_process_focus(1, 10)
fnc.lucky_process_focus(r = 0.01)    # process the whole batch and selects the 1%
     best frames
fnc.lucky_process_defocus()          # process the whole batch
```



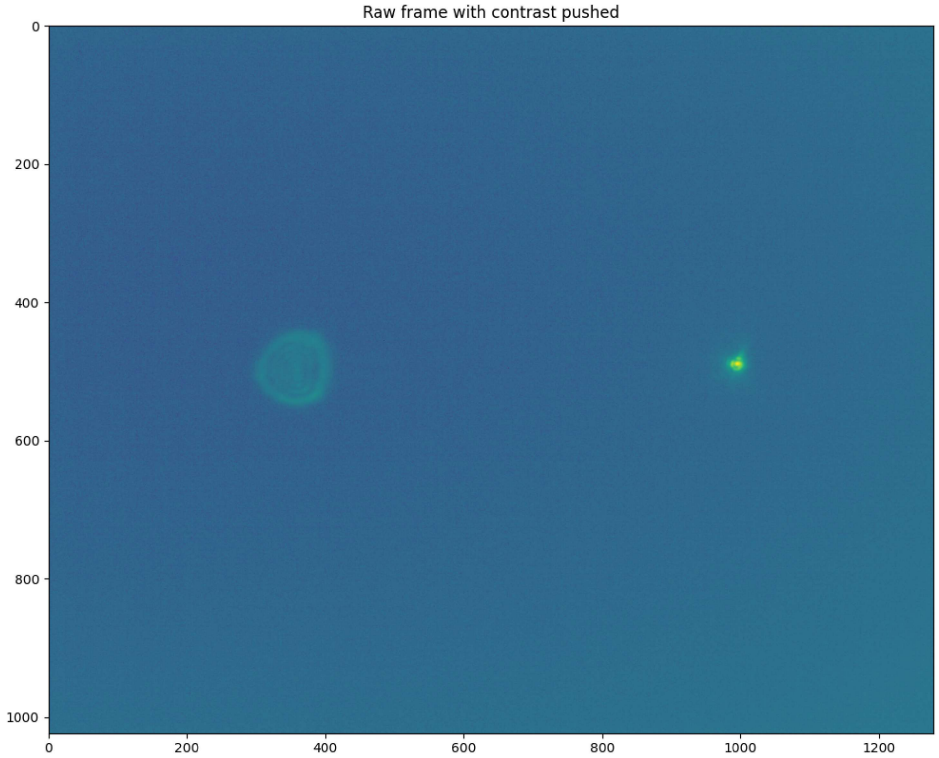
(a) *Badly defined ROI* **(b)** *Correctly defined ROI*

Figure F.1: *ROI's. The scale is in pixels which are 5.3X5.3 µm across.*

F.2.3 Processing results

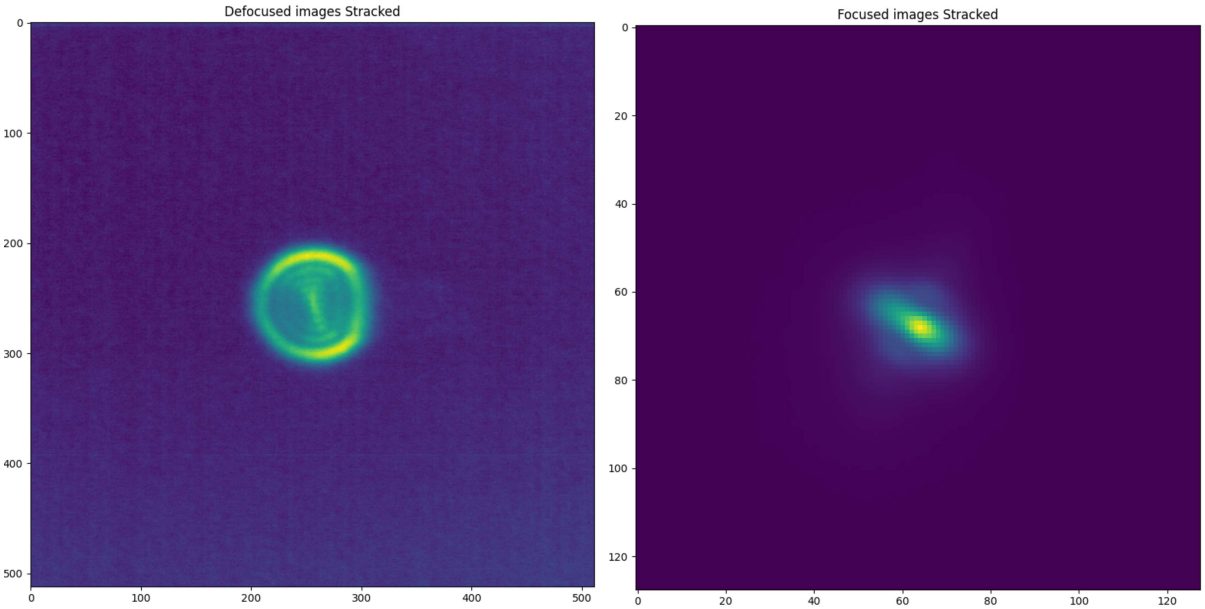


(a) *Raw frame. The colours represent the pixel value*



(b) *Raw frame with its contrast pushed. The colours represent the pixel value*

Figure F.2: *Raw frame taken for lucky processing. No pixel is saturated. The scale is in pixels which are 5.3X5.3 μm across.*



(a) *Defocused processed images* **(b)** *Focused processed images*

Figure F.3: *Processing output. The scale is in pixels which are 5.3X5.3 μm across.*