Detection and tracking of spots

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- We have to upload the file "Tracking_FITC.tiff"
- We have to convert the stack in a time series with the command "Convert to time" in the window "Image/Sequence"
- I decided to modify the histogram as shown in Fig. 1.

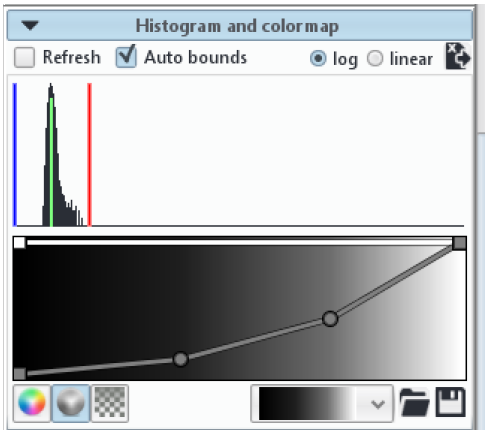
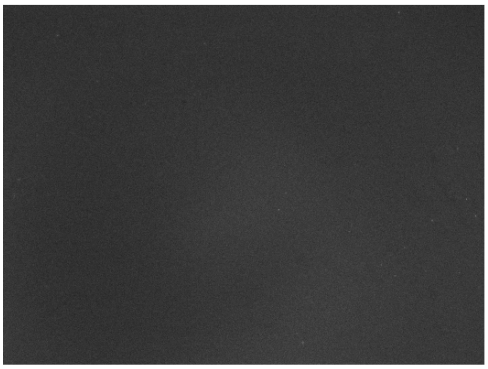


Figure 1: Histogram

In this way from an initial black image we obtain a clearer image shown in Fig. 2

Figure 2: Histogram

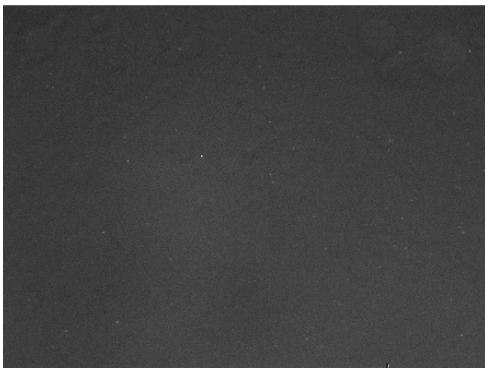
- At this point I used a threshold of value 450(Fig. 3, Fig. 4, Fig. 5), since the begin of the .tiff is more "dark", we will have less points, and at the end much more. Unfortunately, some of the bright points that we detect at the end are noise. subcaption



(a) Pre-Threshold

(b) Post-Threshold

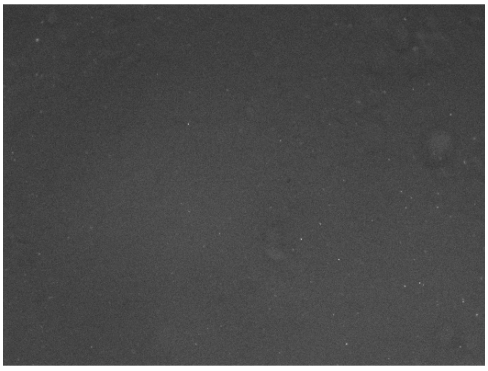
Figure 3: Frame 16



(a) Pre-Threshold

(b) Post-Threshold

Figure 4: Frame 112

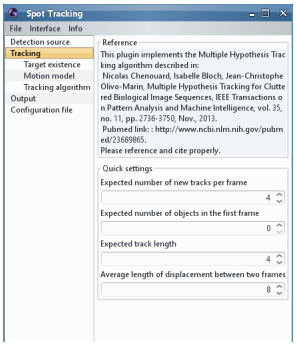


(a) Pre-Threshold

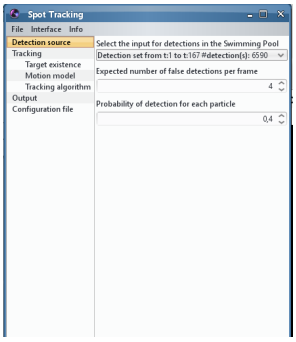
(b) Post-Threshold

Figure 5: Frame 158

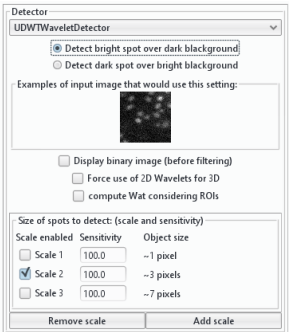
- At this point I applied the detection, I set the parameters as shown in Fig6, to obtain the best result possible:



(a) Advanced parameters



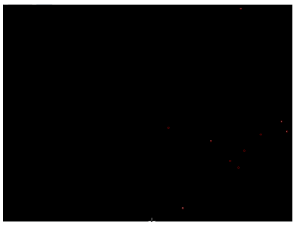
(b) Advanced parameters



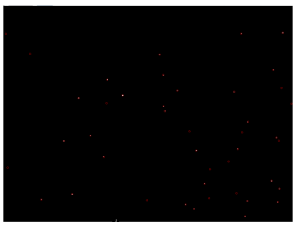
(c) Basic parameters

Figure 6: Parameters Setting

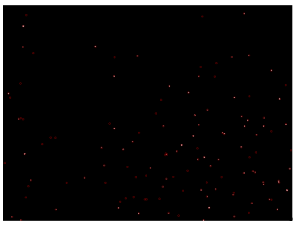
And the results are shown in Fig.7, I still don't understand why there are some red dots in places were no white dots are found.



(a) Frame 16



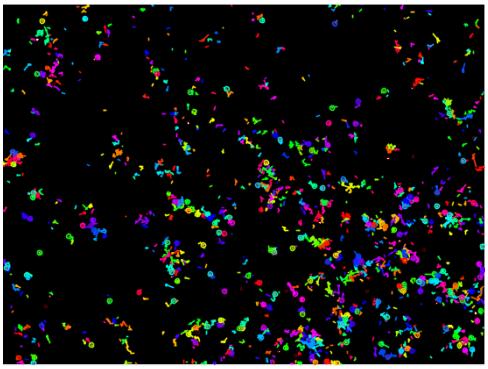
(b) Frame 112



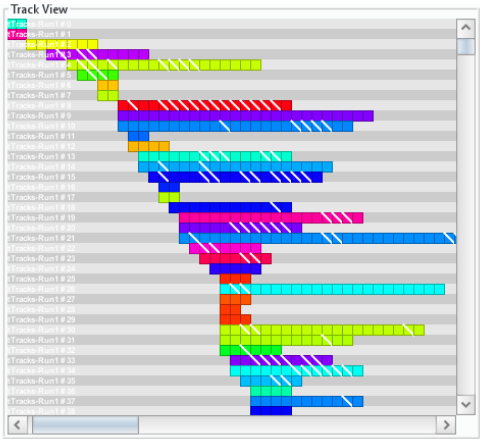
(c) Frame 158

Figure 7: After Detection

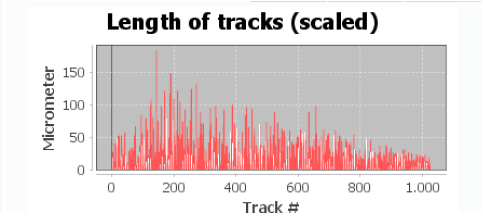
- At this point I used the tracker with a plug-in called **Processor Track Length**, the results are shown in Fig.8, other results obtained with other plug-in are shown in Fig. 9.



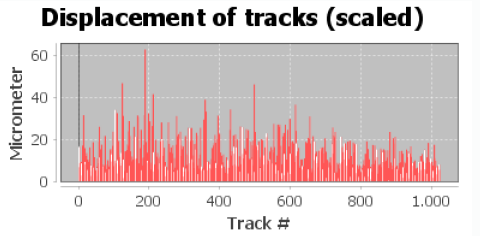
(a) Final result



(b) Tracks

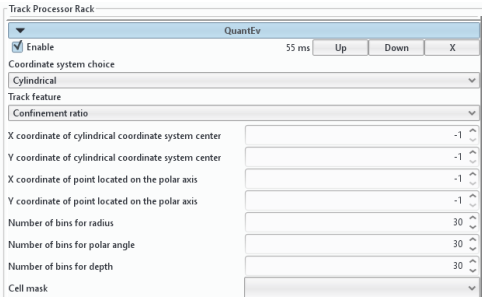


(c) Length of tracks

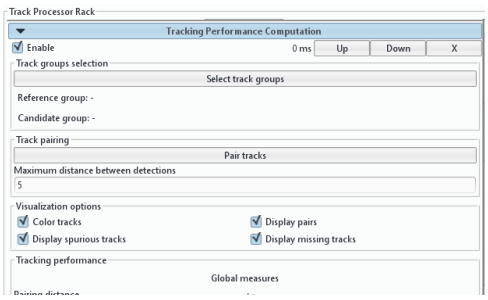


(d) Displacement of tracks

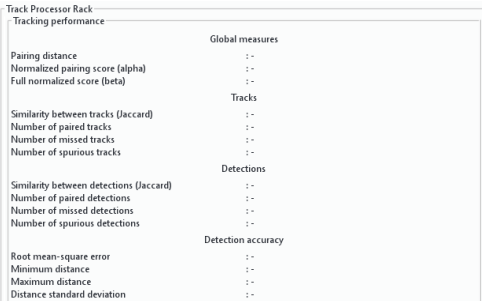
Figure 8: Results



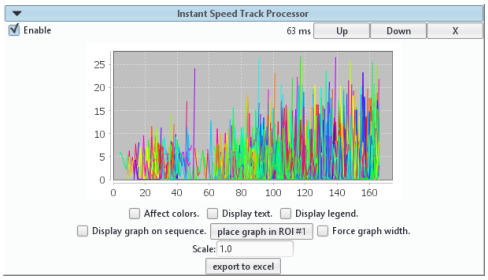
(a) QuantEv



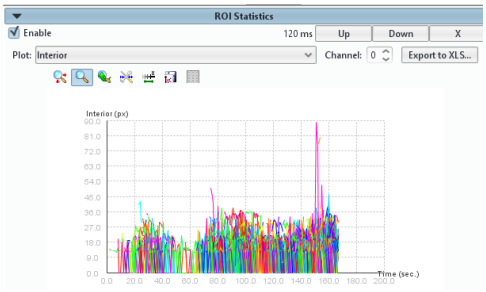
(b) Tracking Performance Computation 1



(c) Tracking Performance Computation 2



(d) Instant speed track processor



(e) ROI Statistics

Figure 9: Other Results

All the white dots are detected correctly, but also other red dots are wrongly detected, and I really can't understand why, since the white dots are pretty visible in the black background. I also tried to modify other parameters, as the object size to 13 pixels(Fig. 10), but unfortunately the results where even worse or the PC wasn't enough powerful and crashed during the process.

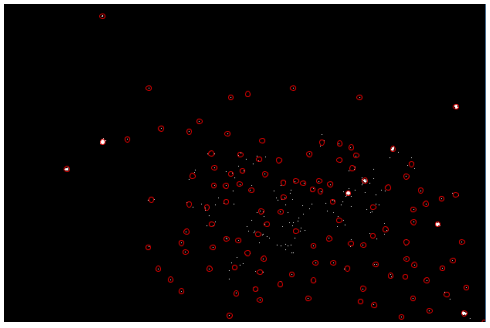


Figure 10: 13 pixels