

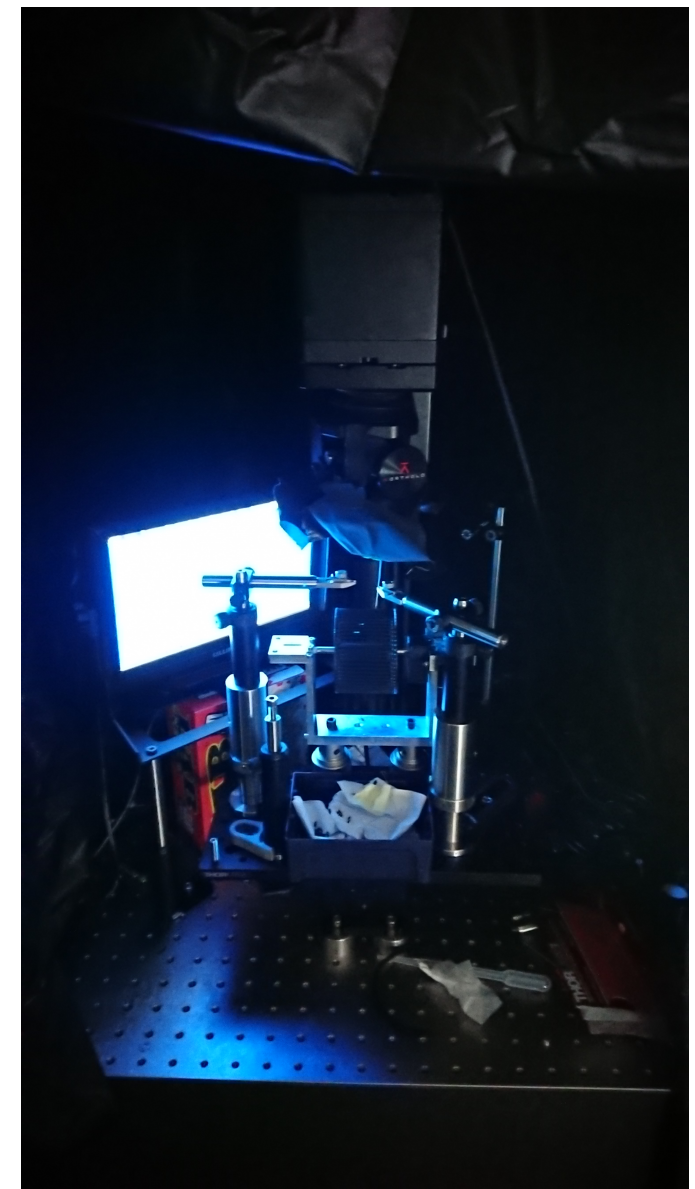
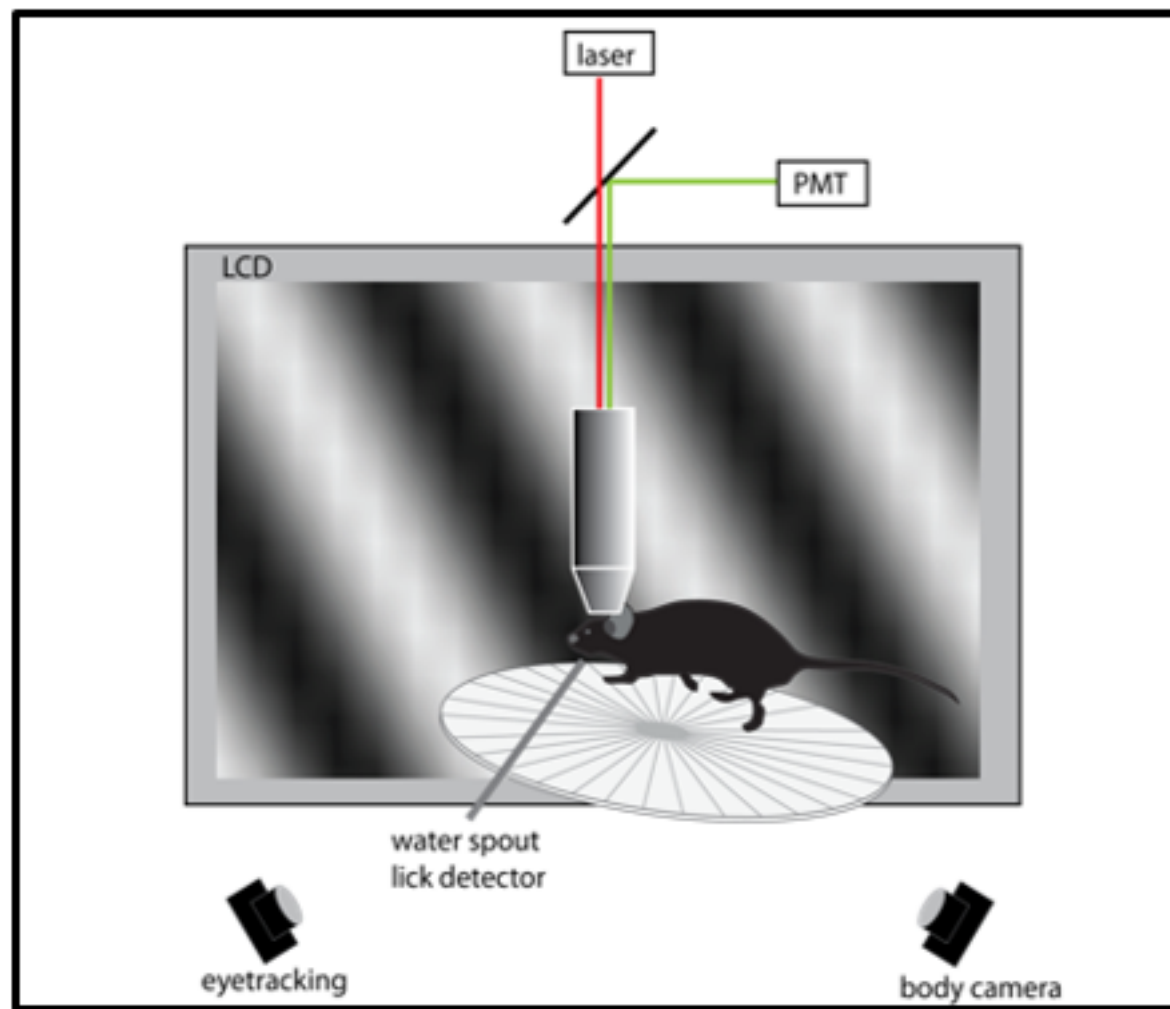
Fast two-photon imaging of a voltage indicator in mouse primary visual cortex

Enrique Hansen

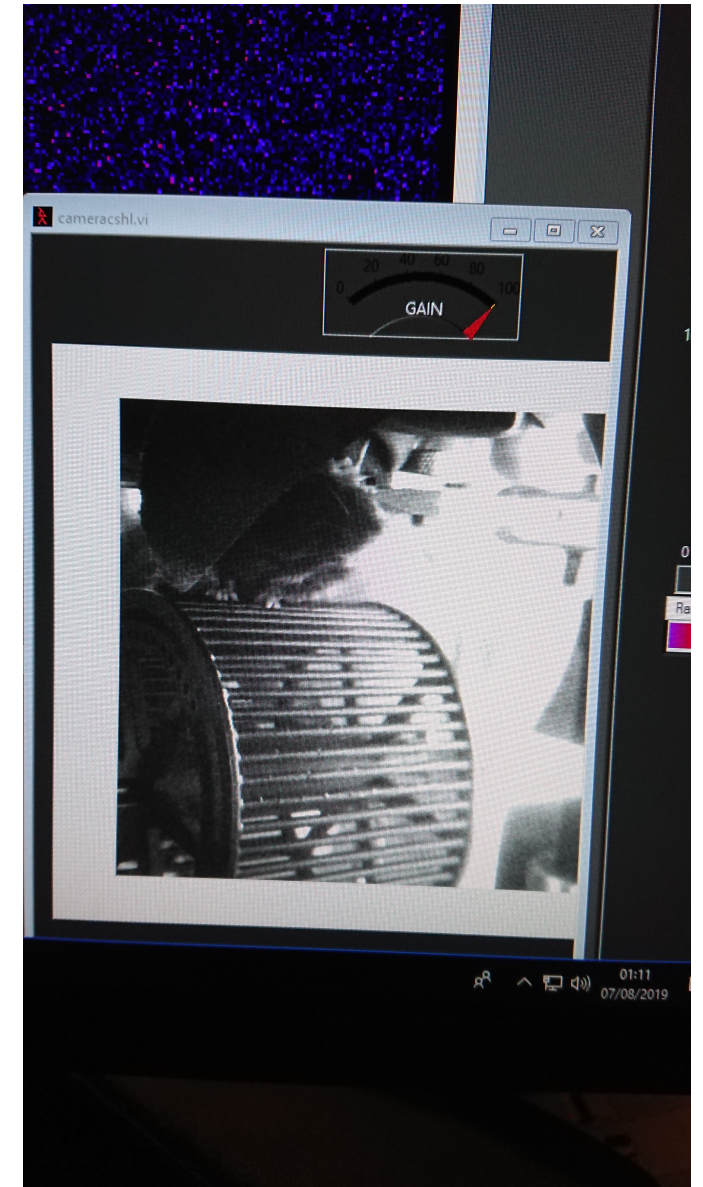
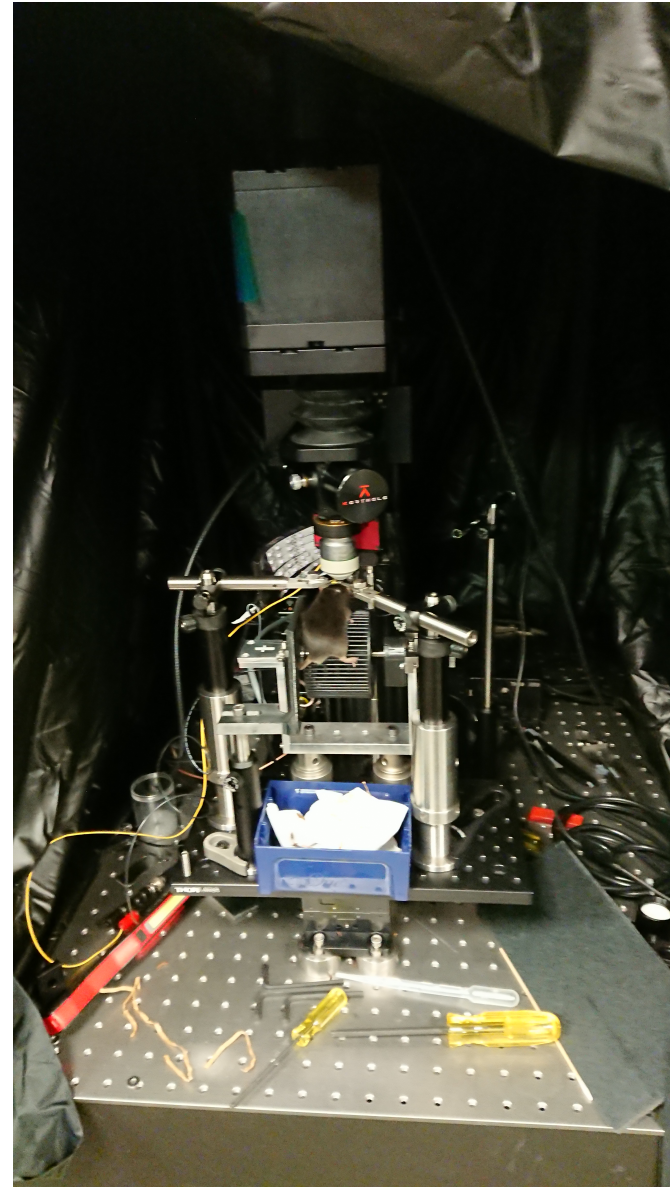
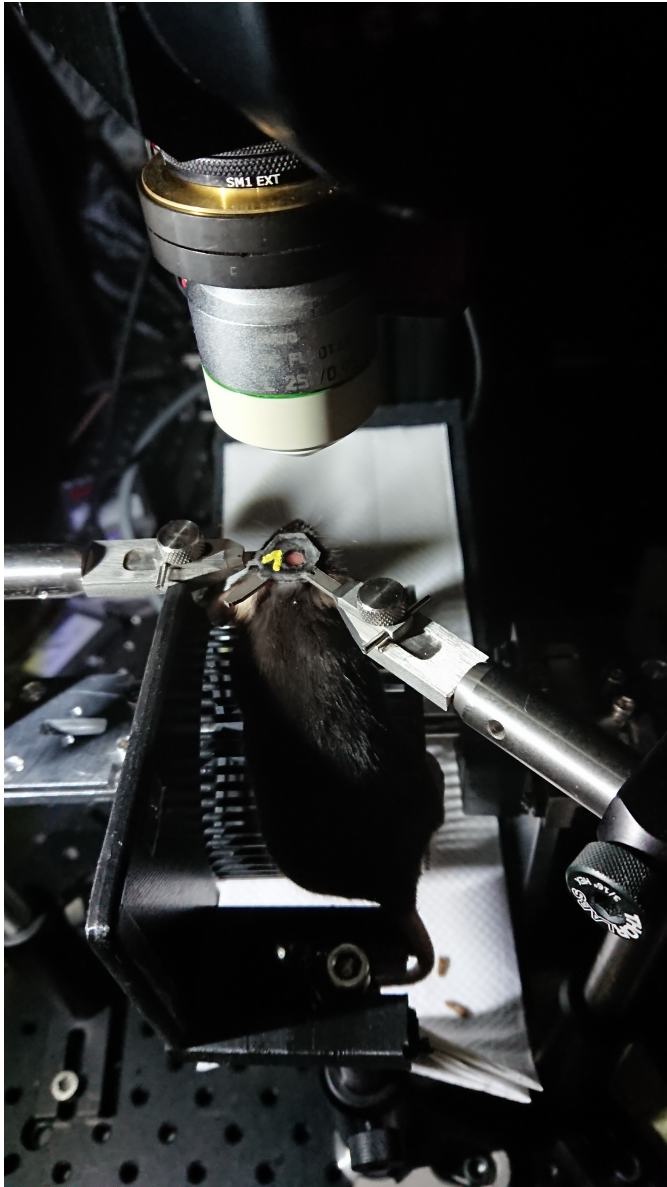
Mouse Data

- Two photon imaging of a mouse.
- Adult mouse.
- The voltage indicator was ASAP3.
- Layer 1 was recorded (71 microns).
- Different positions in the screen were presented to the mouse. In each position, gratings were played.

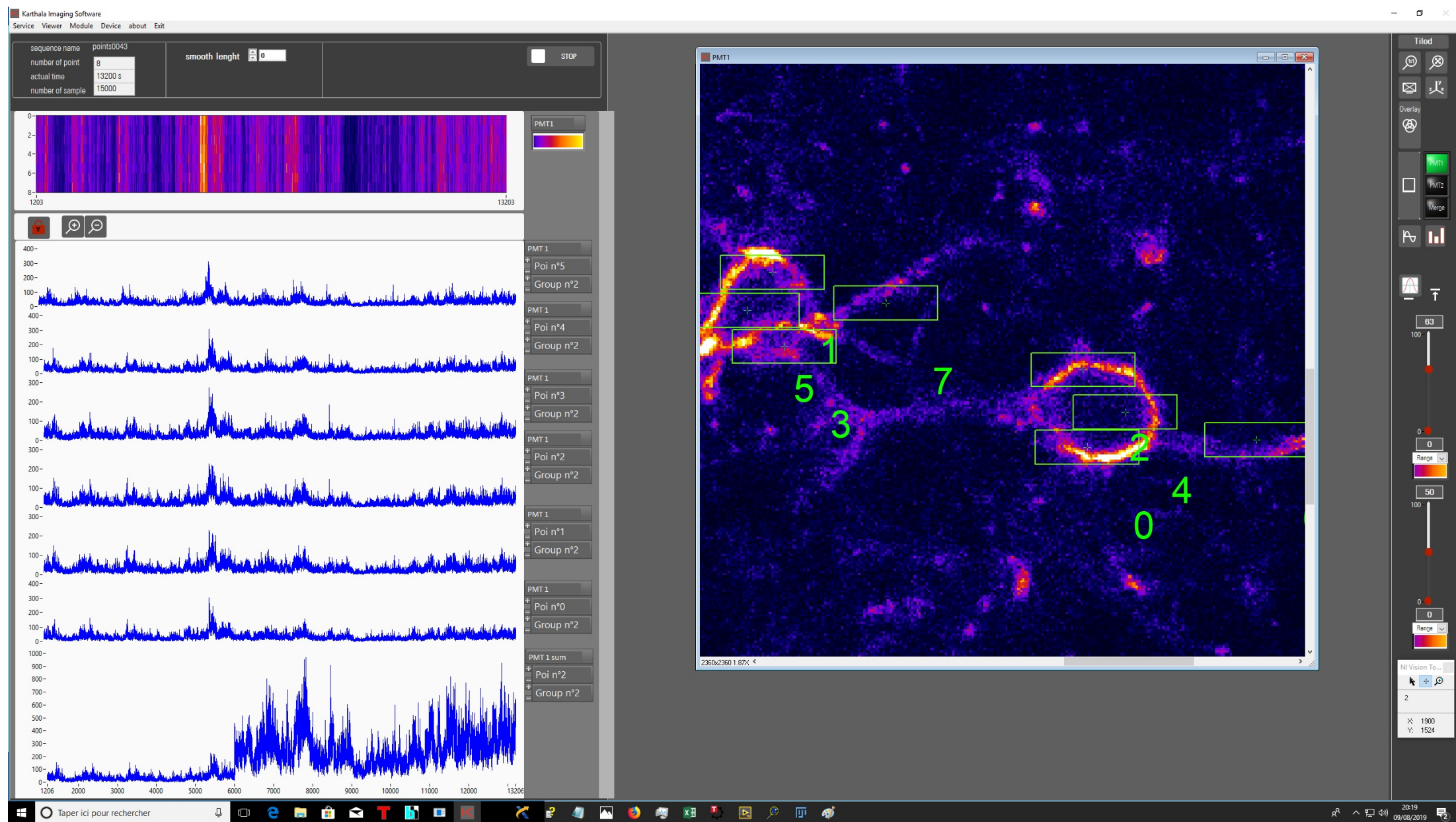
Retinotopic organization in layer 1 (V1) of the mouse



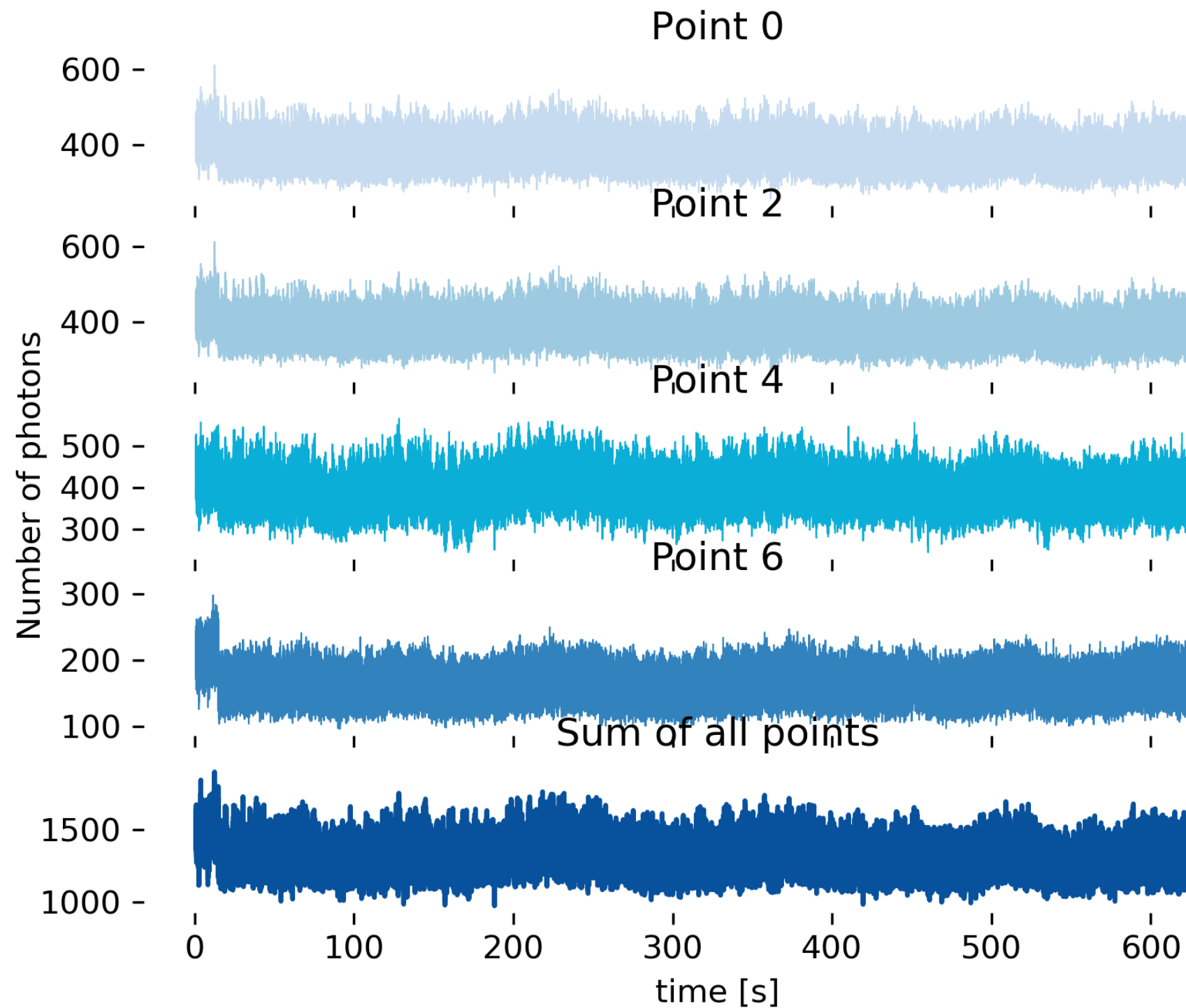
Experimental Setup



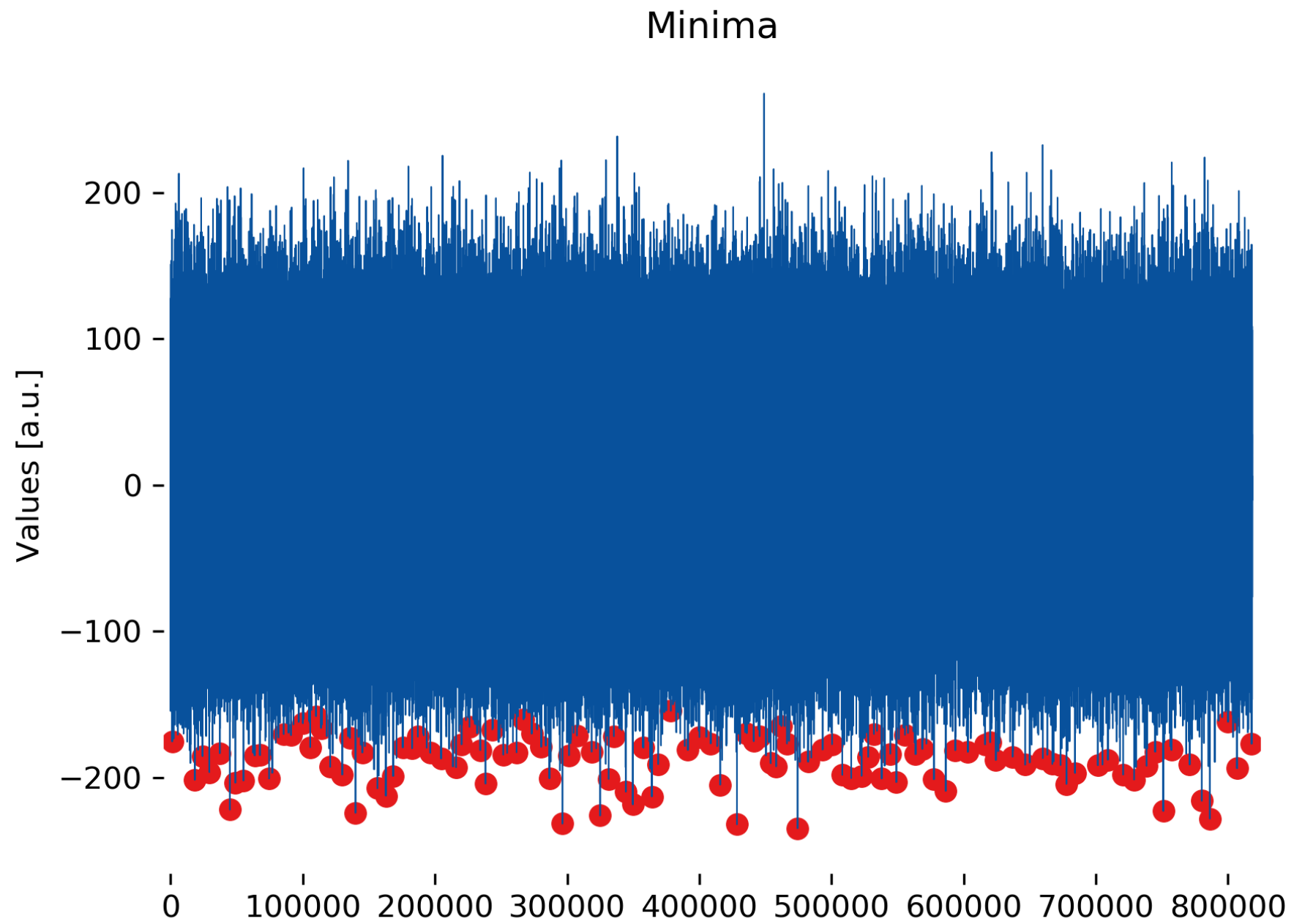
User interface and two neurons in layer 1



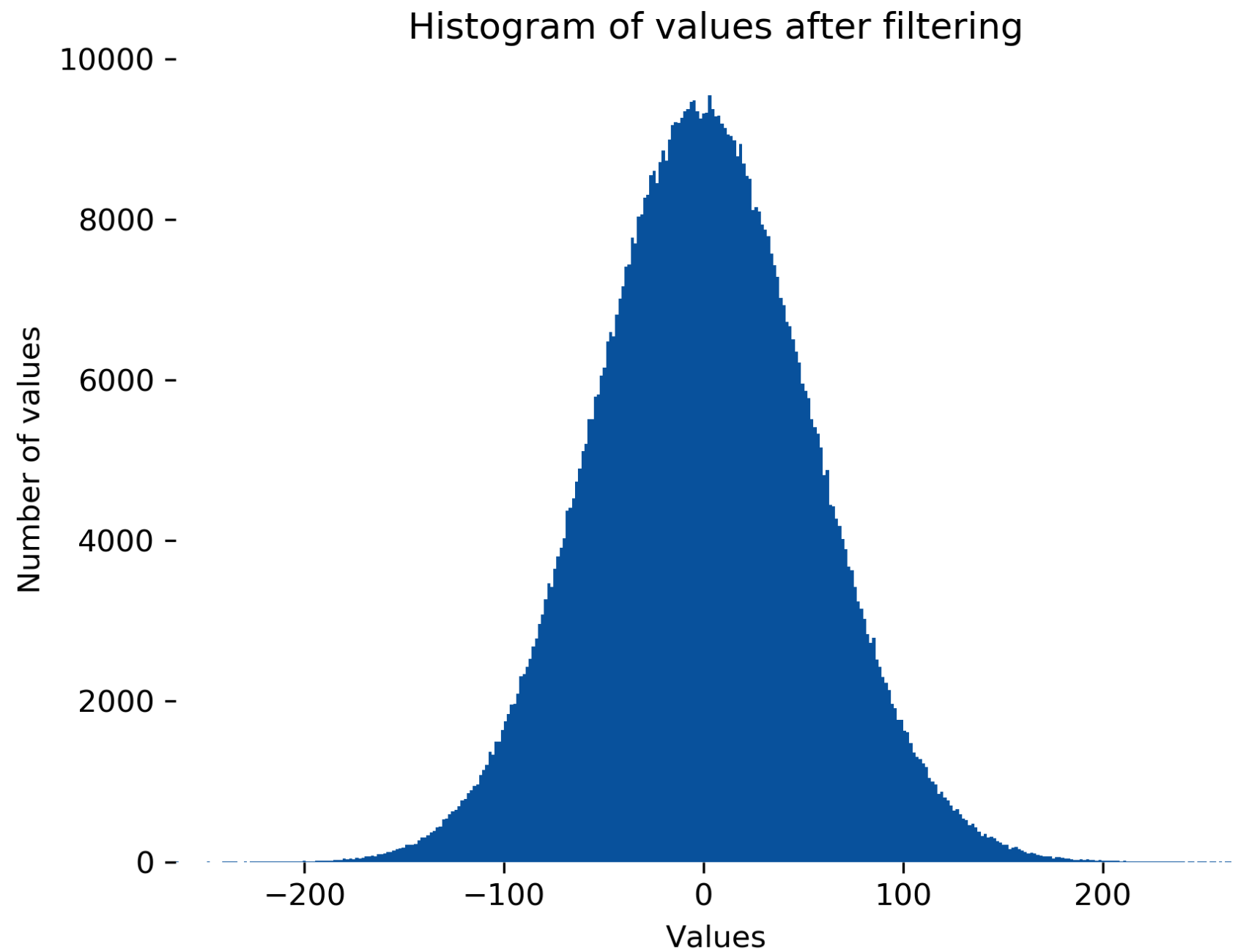
Time series of 4 points of one neuron and the sum of them



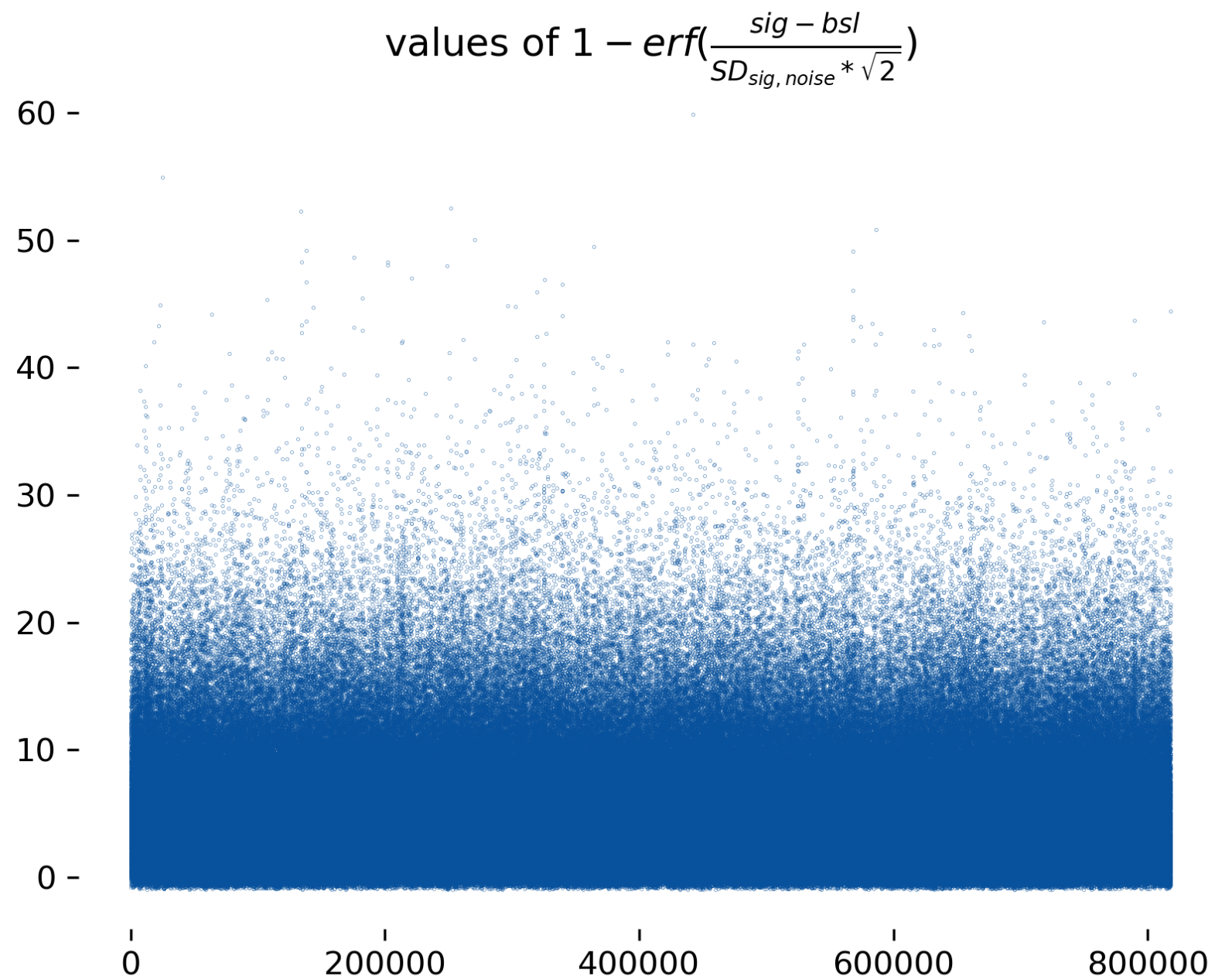
First idea to find the spikes. Find minima.



Using a more complex method.

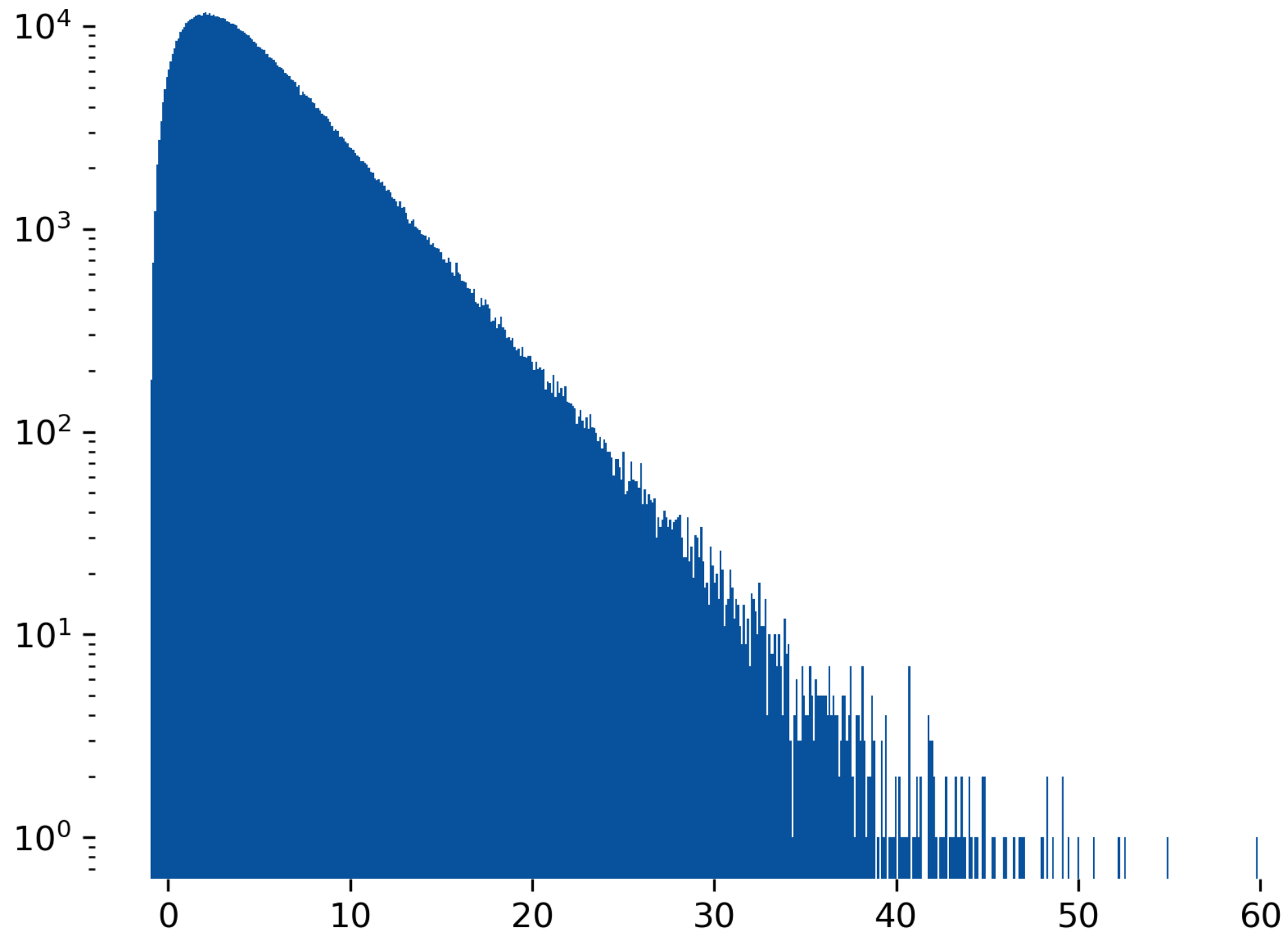


Using a more complex method.

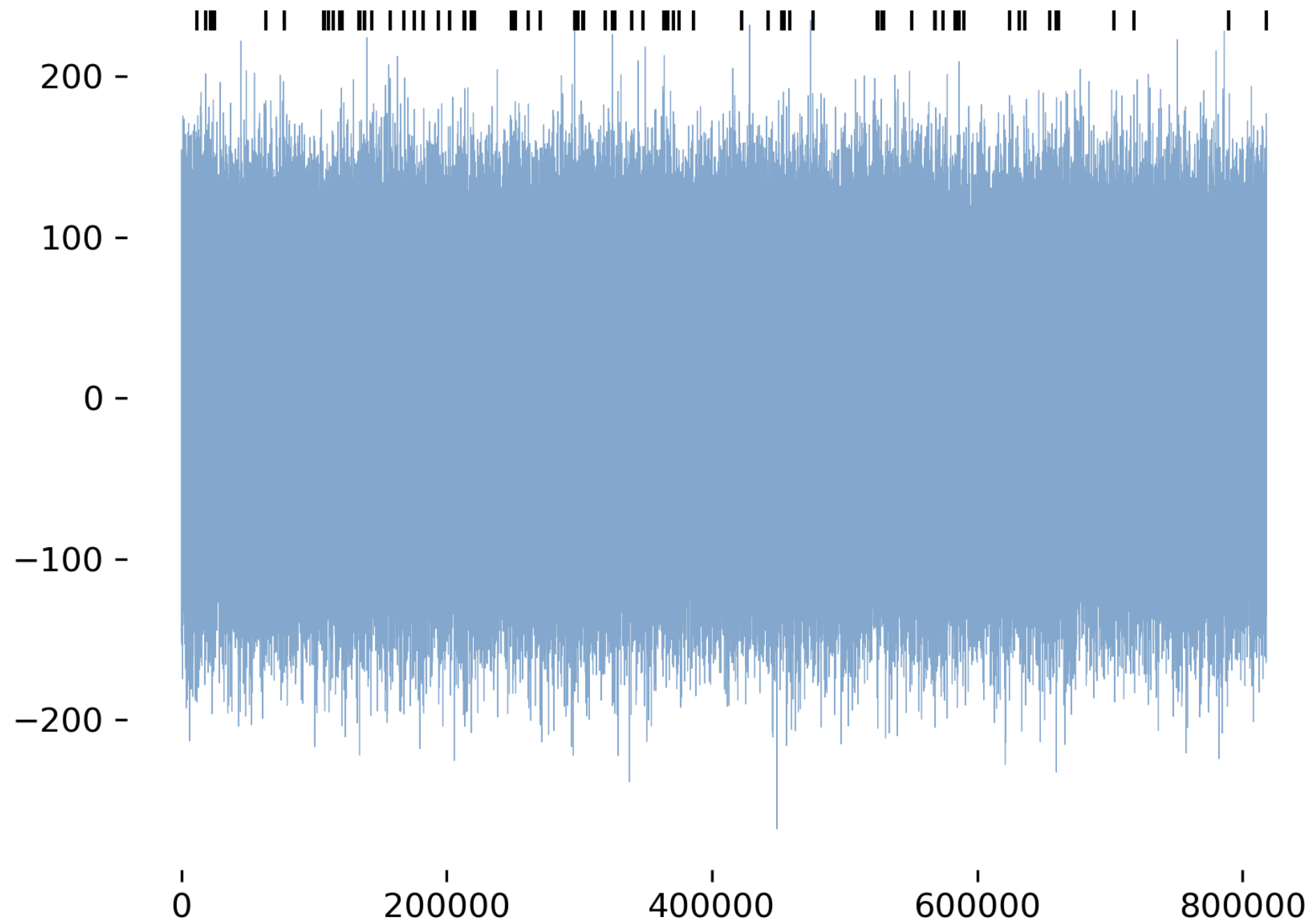


Using a more complex method.

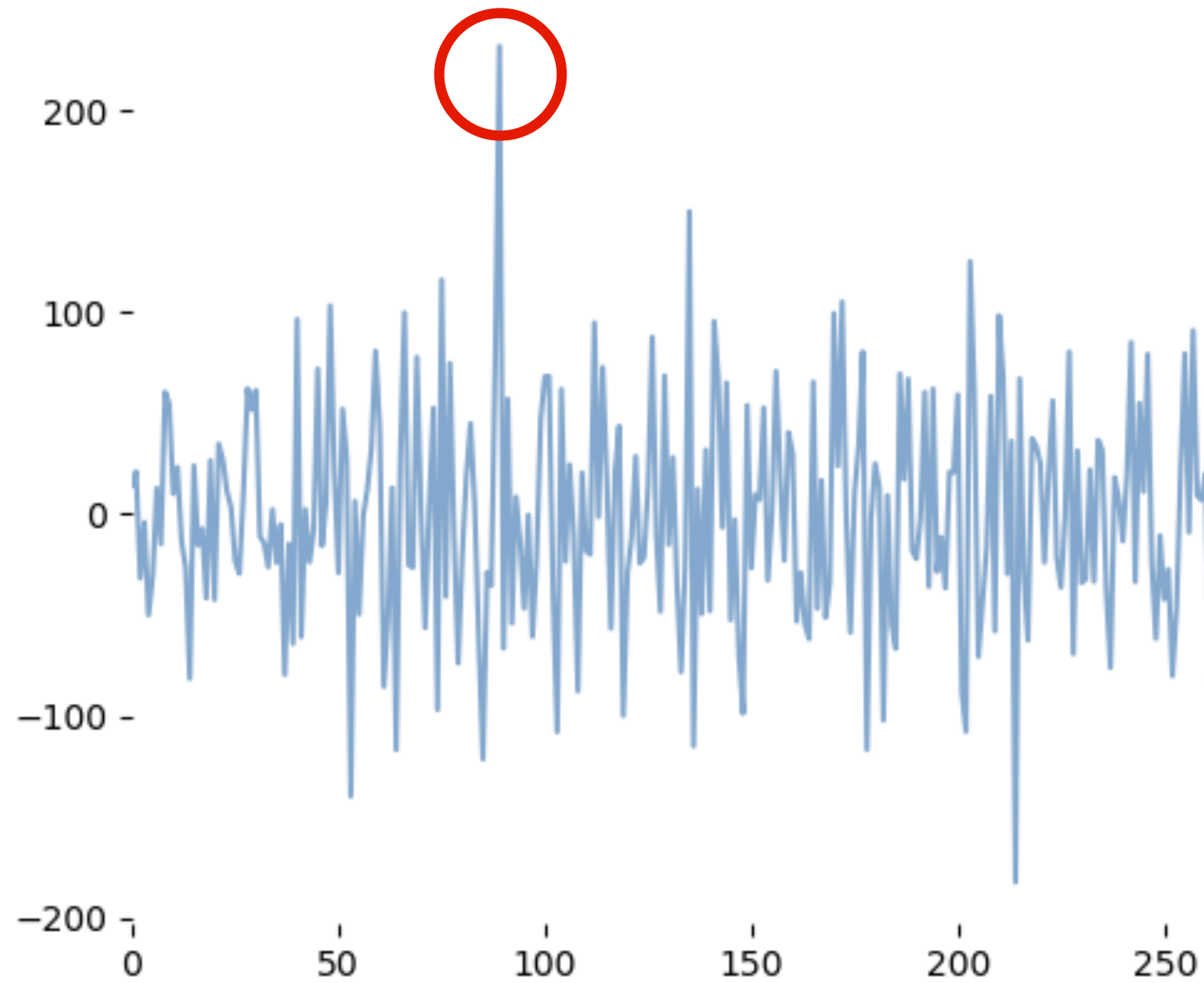
Histogram in log scale of probabilities



Detected Spikes



One Spike in detail



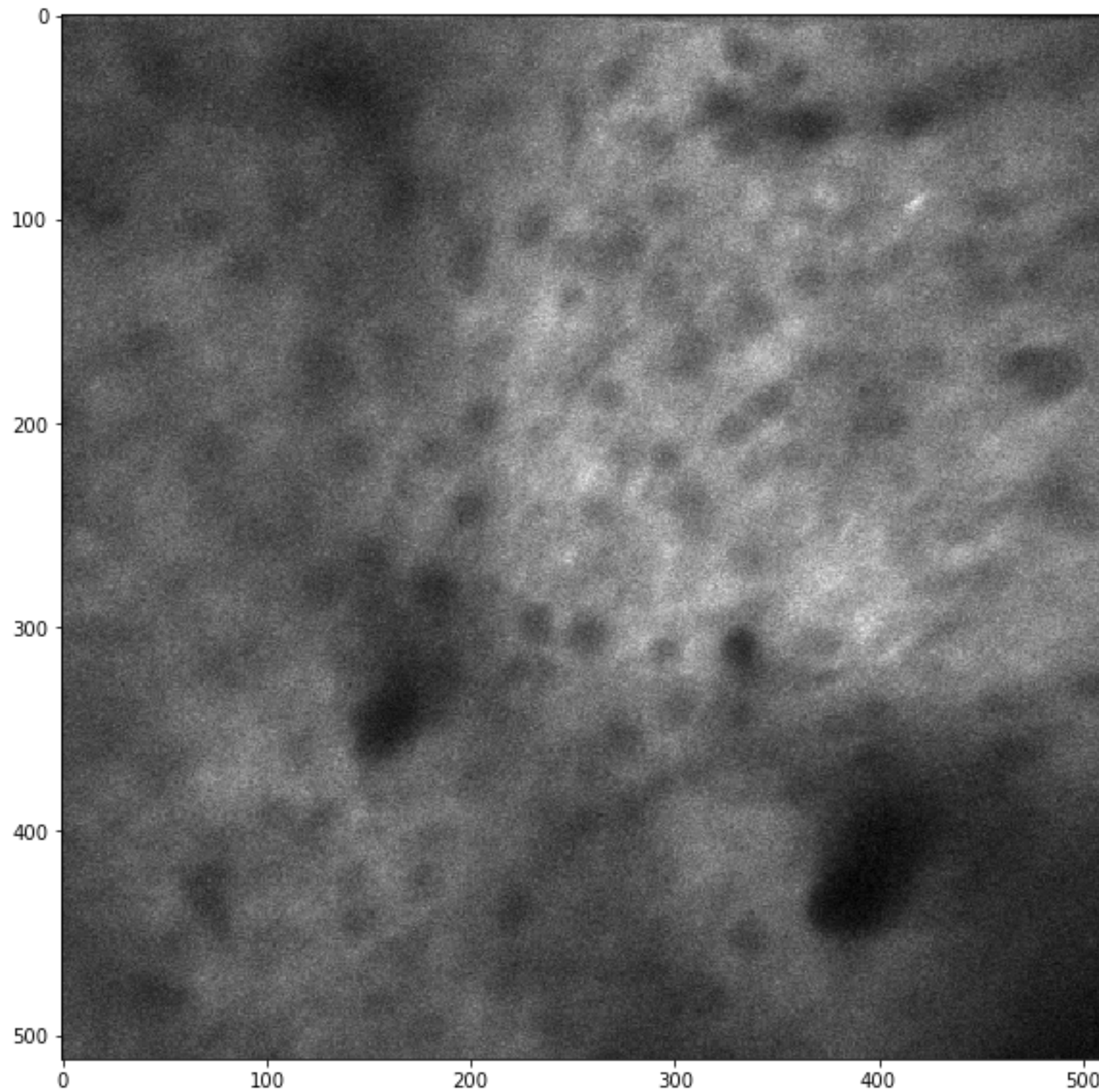
Two-photon imaging of a calcium (GCaMP6s) indicator in mouse primary visual cortex

Mouse Data

- Two photon imaging of a mouse.
- Adult mouse.
- The calcium indicator was GCaMP6s.
- Layers 2/3 were recorded (between 150-200 microns).
- Gratings with eight different orientations in the screen were presented to the mouse.
- The eight gratings were repeated twice each one for three seconds.

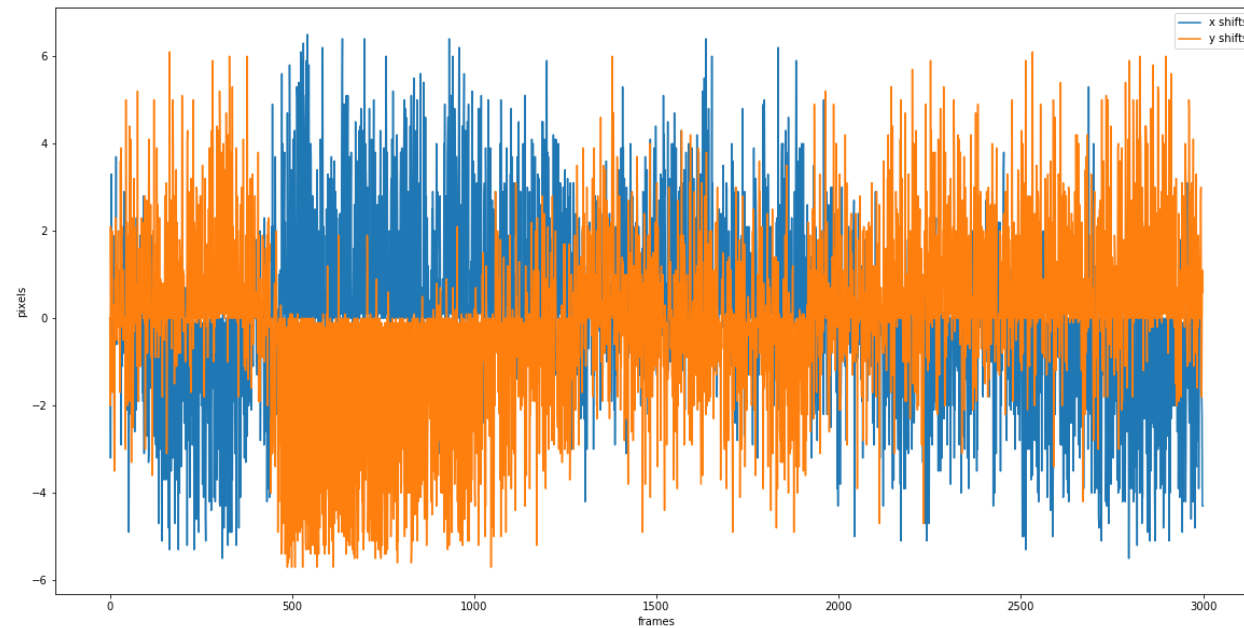
Unfortunately, different algorithms could not register properly the images.

Average of frames after registration

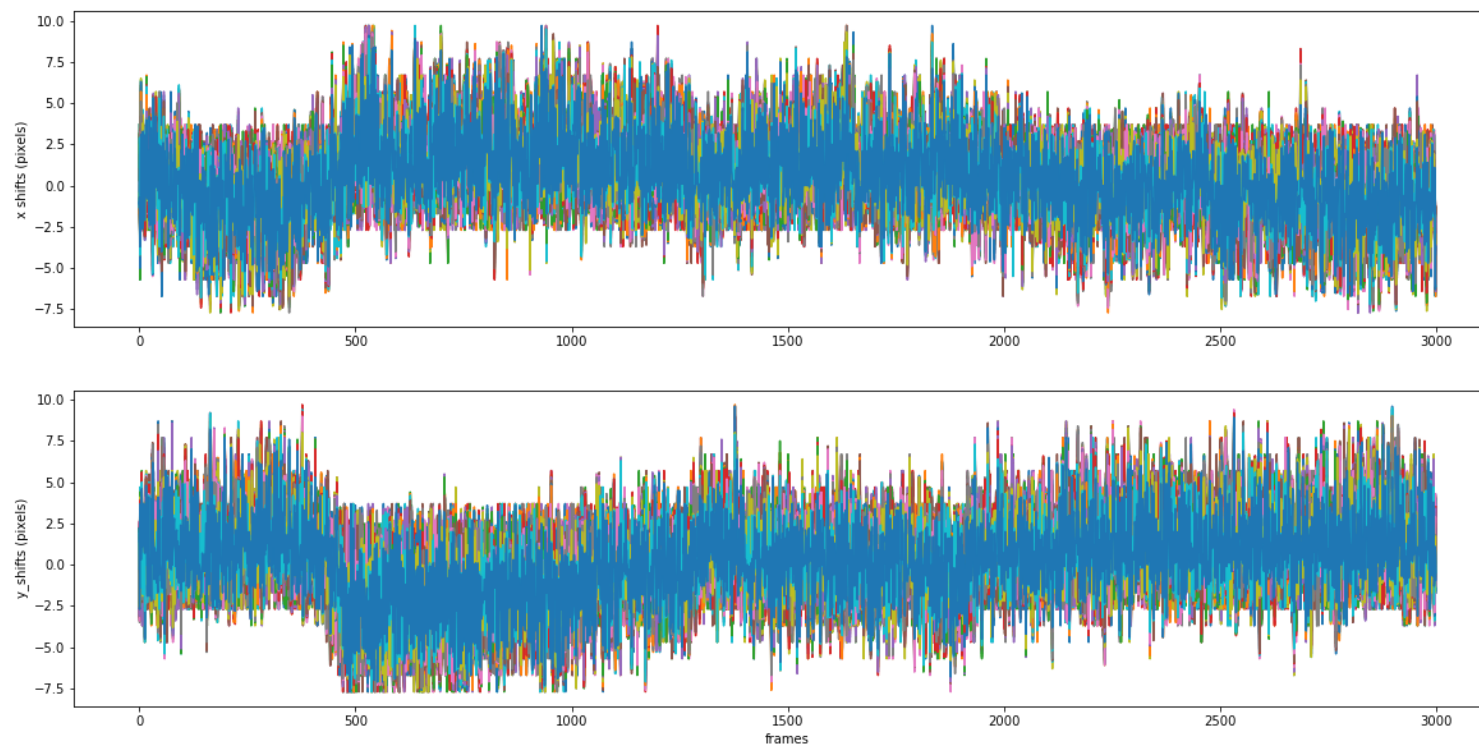


Both rigid and elastic registration found strong movement of the mouse

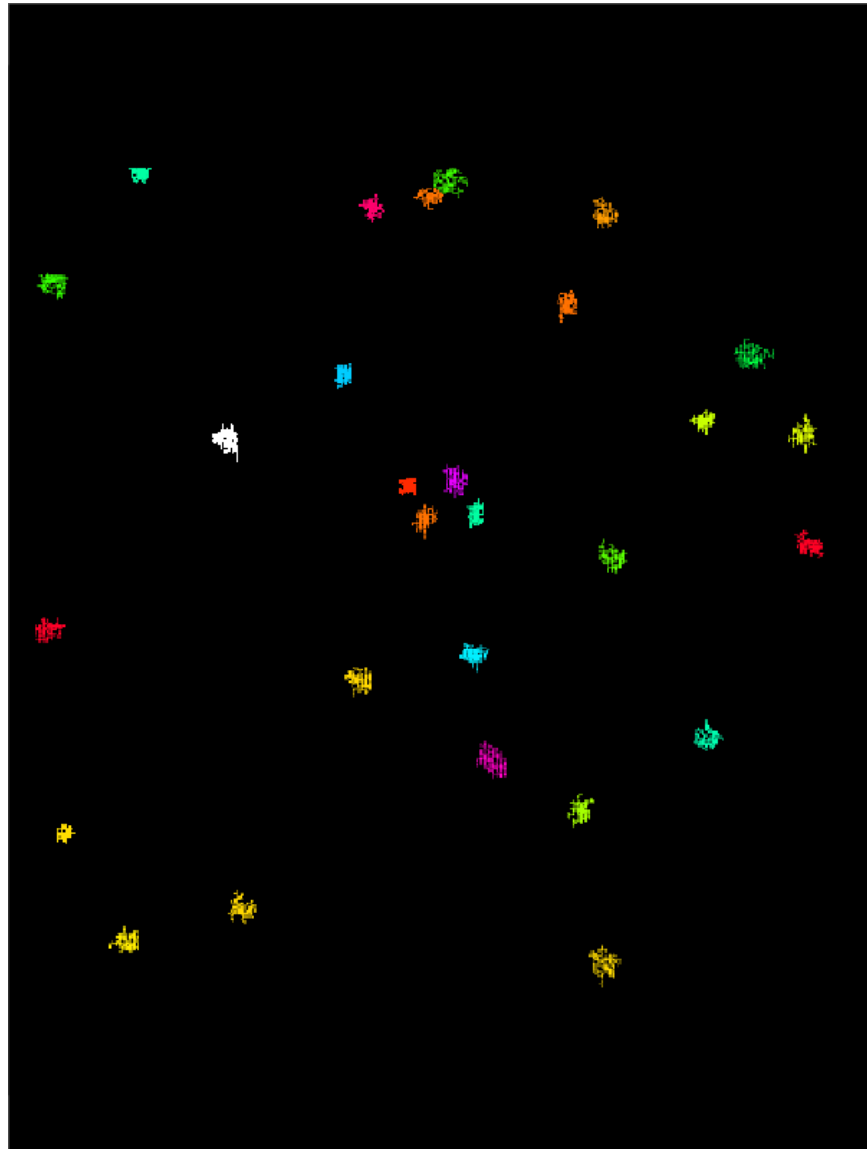
Rigid registration



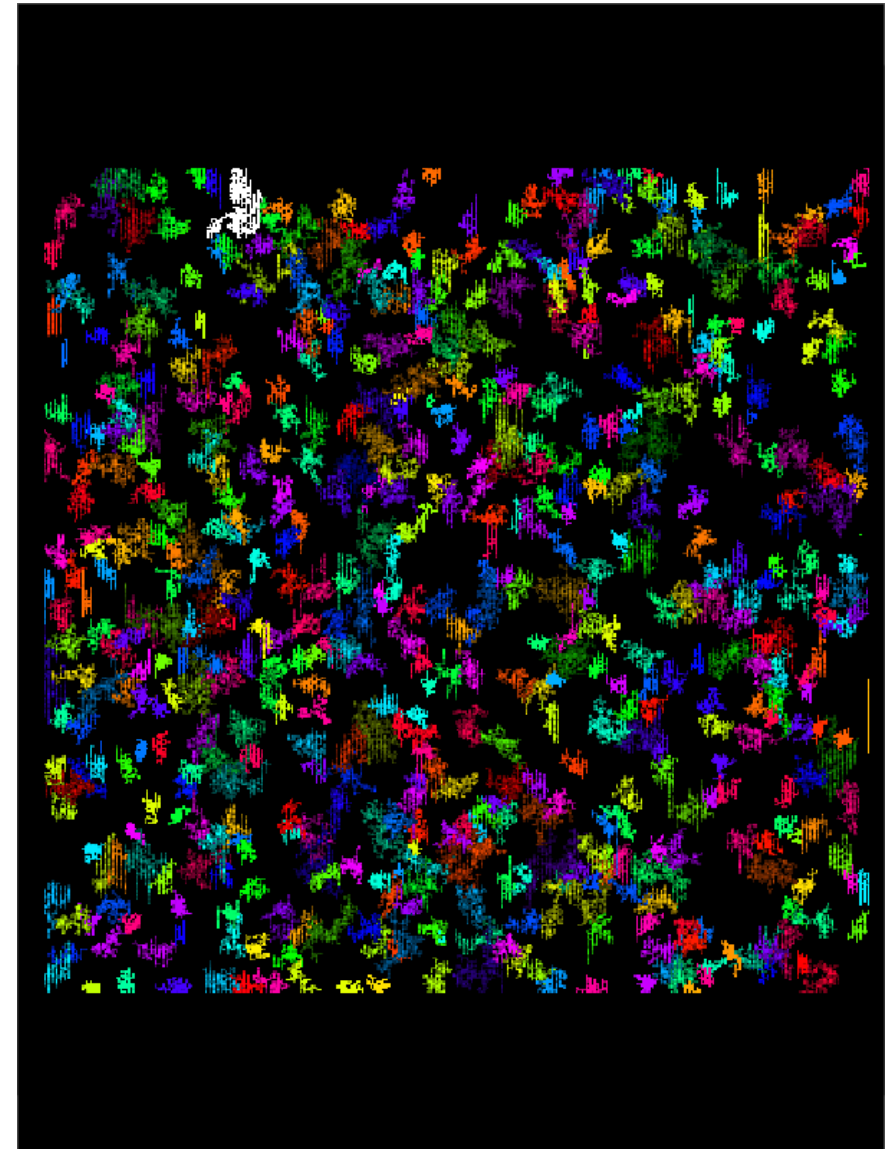
Elastic registration



Suite 2P couldn't find many ROIs



ROIs



Not ROIs

I obtained similar results using CalmAn.

Thanks to



Benjamin Mathieu



Stéphane Dieudonné



Florecnia Iacaruso



Alessandro La Chioma

Thank you!