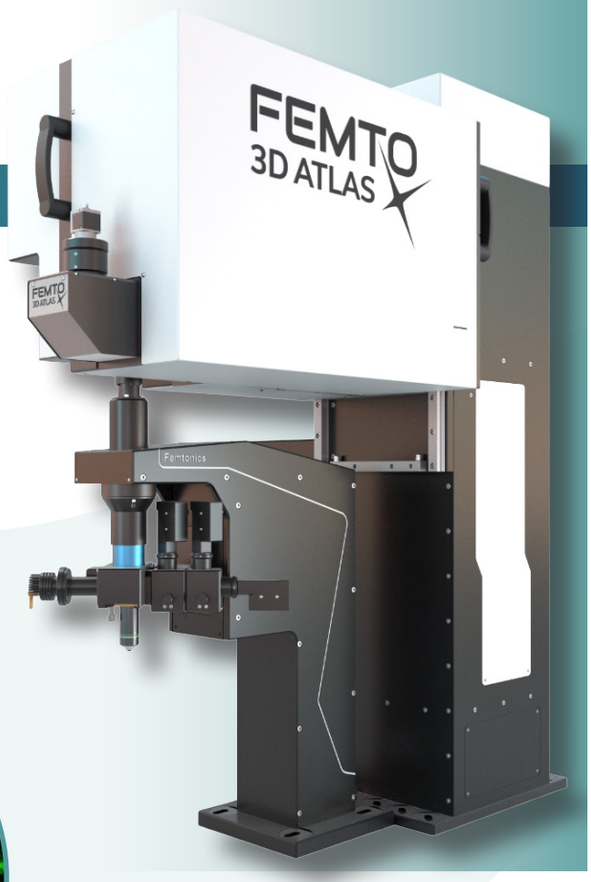
# FOCUSPINNER REAL-TIME MOTION CORRECTION

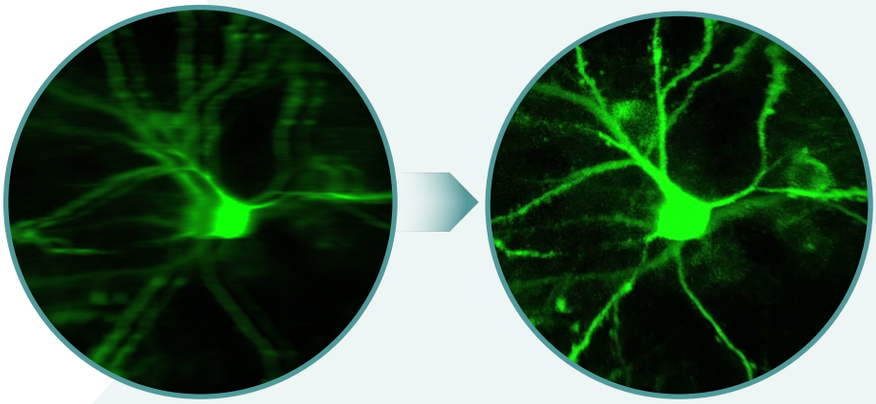
FEMTO 3D ATLAS

## MANY MOTION ARTIFACTS IN VIVO?




**Femtonics Focuspinner**

- ✓ In vivo measurements without motion artifacts, world first in the Z direction.
- ✓ Precise 3D network/dendritic imaging
- ✓ Higher SNR voltage imaging
- ✓ Organoid and structural imaging without artifacts
- ✓ Total FOV alignment during chronic imaging



### ACOUSTO-OPTIC BASED

By leveraging the capabilities of 3D random-access line scanning, our system enables seamless motion correction along each axis, **even in the Z direction**.

### EFFECTIVE AT IN-VIVO MEASUREMENTS

Motion artifacts caused by the movement of the animal, respiration, circulation can be **efficiently eliminated** (average residual motion < 10%), even on movements **up to 50 µm**.

### REAL-TIME

Compared to quasi-real-time solutions the **reaction time is one-tenth**.

### REACTION TIME

The cycle of repeated motion correction is **less than 500 µs**.

### SCANNING MODES

It is compatible with **all scanning modes** of the FEMTO3D Atlas system.

## HOW EFFECTIVE IS THE REAL-TIME MOTION CORRECTION?

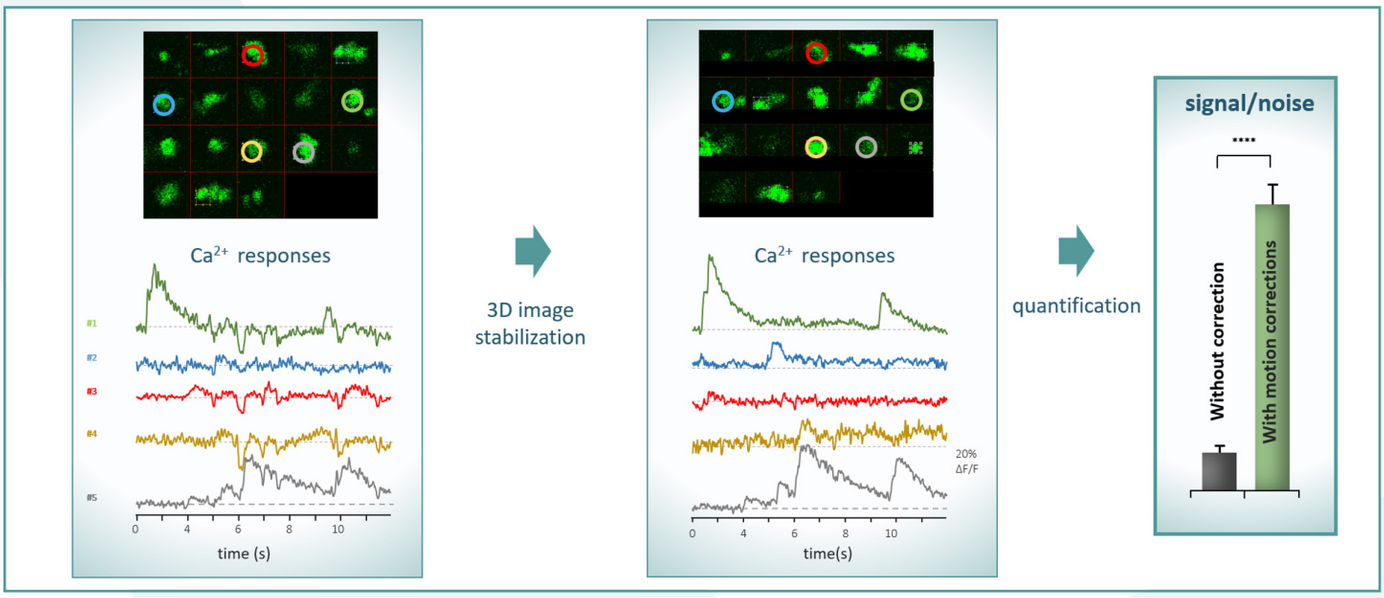



Figure 1: Signal-to-noise ratio (SNR) depends on the size of the region of interest (ROI) being measured. Smaller ROIs provide more accurate information due to the reduced background noise, but they are also more susceptible to motion. With the help of the Femtonics FocusPinner, the **SNR can become orders of magnitude higher**, even for smaller ROIs.

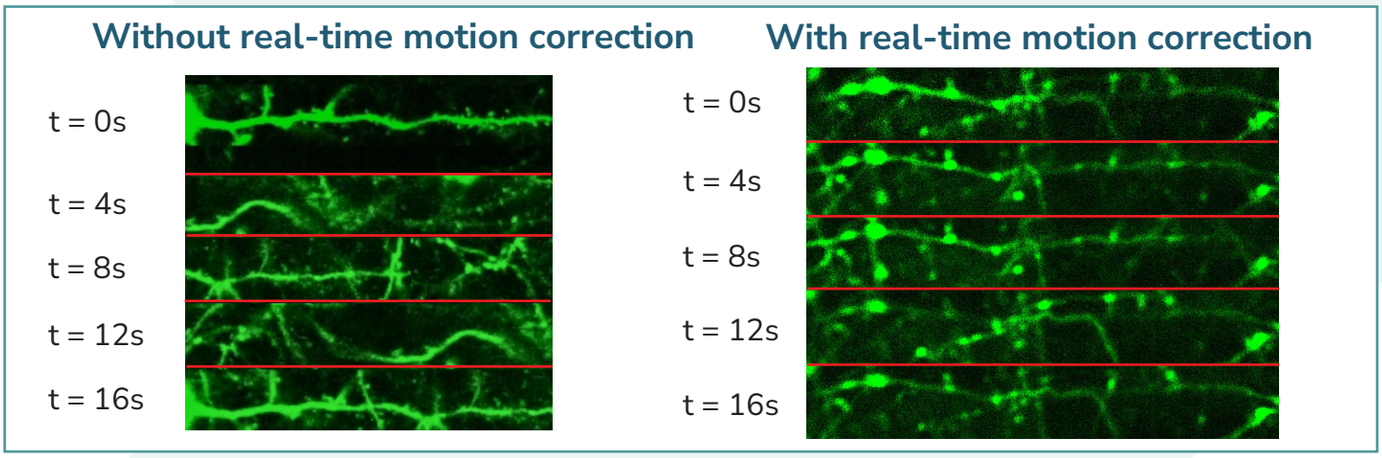



Figure 2: Comparison of two different dendritic measurements, where an image was captured every 4 seconds apart five times in a behaving animal. The image on the left taken without motion correctionshows high likelyhood of false capture, where the dendrites has moved off the ROI either in the XY plane or in Z, while the right shows the complete elimination of these motion artifacts.

### FEMTONICS FOCUSPINNER PROPERTIES

| | |
|---|---|
| Maximum FOV for compensation | 900x900x400 |
| Scanning mode compatibility | All scanning modes |
| Residual motion | Below 10% |
| Z-correction | Available |
| Reference point | Beads, Cells, or any arbitrary rigid object. |


Femtonics Ltd. HQ
www.femtonics.eu
sales@femtonics.eu

**Authors:**

Gergely Szalay PhD
HUN-REN, Institue of Experimental Medicine, 3D Functional Network and Dendritic Imaging Research Group, Budapest
BrainVisionCenter Research Institute and Competence Centre, Budapest

Viktória Kiss PhD
Application Specialist
Femtonics