

HIGH-SPEED ARBITRARY FRAME SCANNING

FEMTO 3D ATLAS

IN VIVO IMAGING IN BEHAVING ANIMALS

- **FAST:** Imaging at 40 fps, 510 x 510 pixels.
- **FREE:** Imaging plane can be rotated arbitrarily in 3D.
- **POTENTIAL:** Voltage-sensitive fluorescence imaging at high speed.
- **SILENT:** Eliminated scanner noise.
- **SHARP:** High optical resolution gives access to submicron features.
- **EASY:** User-friendly software with motion correction.

FAST:

THE FASTEST FRAME SCANNING

We are proud to introduce the new high-speed arbitrary frame mode of Atlas, our flagship microscope. Acquiring data at 40 frames per second (fps), Atlas outperforms standard resonant-galvo-based multiphoton microscopes that can scan at 30 fps.

FREE:

TILT OR DISPLACE YOUR SCANNING PLANE

Researchers often need to take volumetric scans to capture an oblique structure in the sample. Traditional microscopes offer opto-mechanics-based solutions to step across planes, which are slow and spend scanning time in regions where no feature of interest may be located. With Atlas, you are free from mechanical constraints in all dimensions, thus you can leverage the highest flexibility in tilting or rotating the imaged plane in a 3D space. Your imaged plane can even be perpendicular to the axis of your objective, while data is acquired at 40 fps. This freedom can prove even more useful when you need to track oblique features in your sample in time. With Atlas you can align your plane or 3D stack with the orientation of your feature of interest, thereby saving significant scanning time or gaining temporal resolution.

POTENTIAL:

VOLTAGE-SENSITIVE FLUORESCENCE IMAGING AT KILOFRAMES SCANNING SPEED

With Atlas, you can focus on small features (e.g. a neuronal dendrite) and only record the field of view covering your feature at a very high speed! For example imaging a dendritic segment with 300x10 pixels resolution will result in a 3000 fps speed, that opens the way to monitor fast events. With Atlas you are best served to perform voltage sensor recordings. You can freely tailor the covered area in 3D and achieve a sampling speed appropriate for voltage imaging.

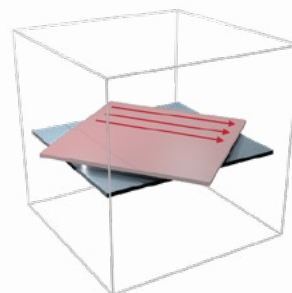
THINKING AHEAD

FEMTONICS
MICROSCOPY

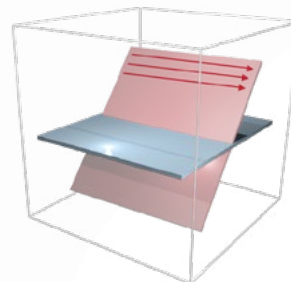
Femtonics Ltd. HQ | info@femtonics.eu | www.femtonics.eu
Femtonics Inc. USA | usa@femtonics.us

40 fps

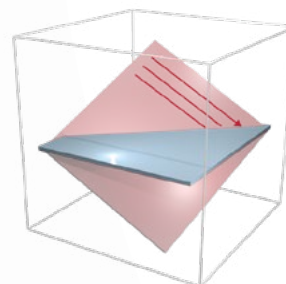
510 x 510 pixels
500 x 500 μm^2



XY rotation



YZ rotation



XYZ rotation

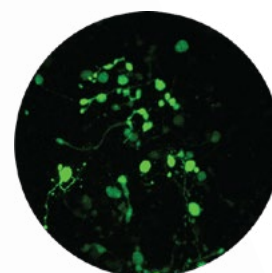


Image recorded from a cerebral organoid in the Losonczy lab, Columbia University, USA

FEMTO 3D ATLAS

SHARP:

UNCOMPROMISED IMAGE QUALITY

Speed and resolution: a question of either/or? You may have faced this compromise using traditional microscopes. With Atlas, the highest resolution is maintained independently of the scanning speed. The acousto-optic technology powering the high-speed frame scanning ensures that resolution is maintained even at the highest scanning speeds. With Atlas, you can resolve features as small as 0.5 μm at any scanning speed up to 650 μm deep in living tissue.

SILENT:

DISTURBANCE-FREE EXPERIMENTS

Long hours spent at a galvo- or resonant-scanner-based microscope are marked by the whining noise emitted by the mechanical scanners. Sound isolation in newer microscopes may alleviate the strain on your ears but the brain of animals undergoing *in vivo* experiments in a multiphoton microscope will notice. Such experimental confounds can be best avoided with Atlas, which lacks mechanical scanning elements, thus offering the best possible noise-free environment for both the user and the subject.

EASY:

USER-FRIENDLY SOFTWARE WITH MOTION CORRECTION

Navigating through your sample in 3D is made easy by our new user interface elements that visualize the relation between the current orientation of the imaging plane and the objective. A non-rigid motion correction algorithm helps to preserve the fluorescence data in behaving animal models.

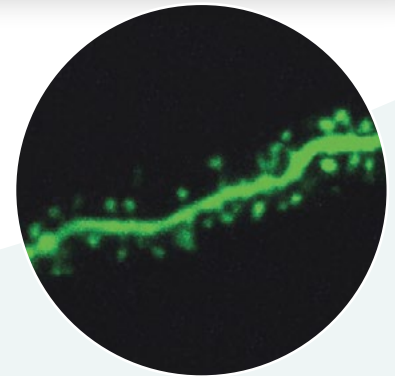
SCIENTIFIC APPLICATIONS OF ATLAS INCLUDE

- *In vivo* imaging in behaving animal models
- Imaging neuronal network activity in 3D
- Covering oblique features in the tissue (dendrites)
- A new era in neuronal activity imaging: sample voltage-sensitive fluorescence signals at high speed and high resolution
- Imaging organoids

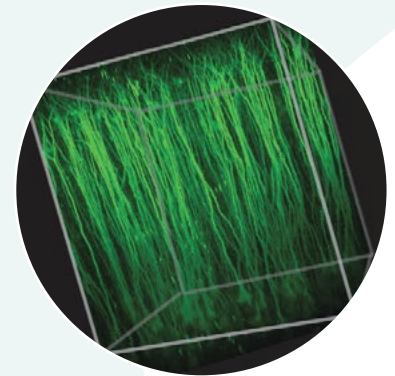
WATCH VIDEOS

 femtonics.eu/products/femto3d-atlas

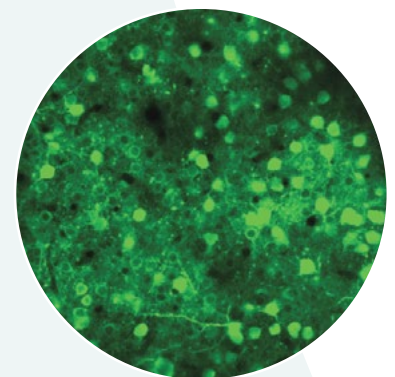
 [Youtube/Femtonics](https://www.youtube.com/Femtonics)



Dendrite with spines



Imaging plane aligned to oblique target structures



Monitoring neuronal activity in primary visual cortex

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