# VOLUMETRIC IMAGING IN FOURIER INTEGRAL MICROSCOPY

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Fourier integral imaging microscopy (FiMic) represents a variation of the conventional integral (or Lightfield) microscope [1]. Instead of placing a microlens array in the proximity of the image plane of the microscope, in the FiMic setup an array of lenses of milimetric size is located in the aperture stop of the microscope objective [2]. This convenient setup allows the direct acquisition of several views of the sample in one-shot. These views can be interpreted as a spatio-angular multiplexing of the sample information, allowing the extraction of three-dimensional features by computational means. However, standard reconstruction algorithms used in integral imaging cannot provide 3D images *stricto-senso*. Typically, the algorithms permit to refocus different planes of a 3D scene and, by doing so; different focusing planes are affected by out-of-focus light coming from the rest of the planes.

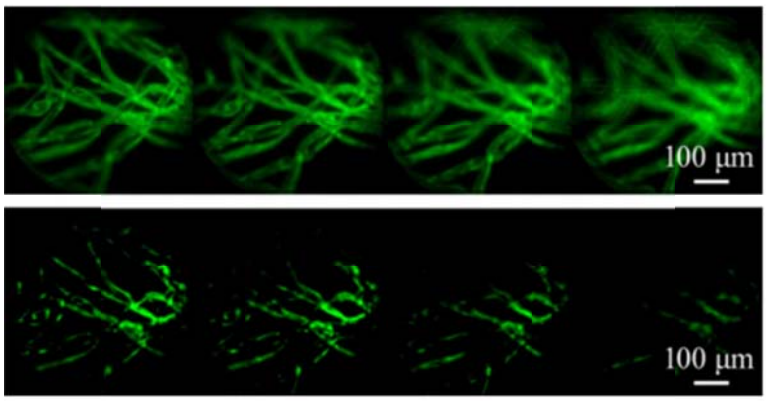


Figure 1: FiMic refocusing planes obtained by means of (up) conventional method and (down) proposed method.

We present alternative reconstruction algorithms that are especially suitable for FiMic when working with fluorescent samples. These methods relay on the direct acquisition of the sample views, which are key in order to redefine the reconstruction space [3]. The methods can be potentially applicable for reconstructing 3D samples in real-time.

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