
Multi-scale optical zoom microscopy based on liquid lens

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A new microscope based on liquid lens is developed, which can realize the functions of large FOV, large working distance (WD) range and fast zoom at the same time. The core of the microscope is a self-designed adaptive multi scale (AMS) structure and zoom objective. An AMS imaging mechanism is proposed to realize large FOV and aberration correction. The zoom objective lens realizes the fast zoom function by changing the voltage of the liquid lens, in which the driving of the liquid lens is developed by ourselves. A non-uniform distortion correction algorithm and a composite patching algorithm are designed to improve the image quality. With such a microscope, large FOV, large WD range and fast zoom microscopic imaging can be realized. The continuous tunable magnification range is 9×-18×, the extended WD range is 800μm, the maximum FOV is 2.31mm, and the zoom response time is 38ms.

References

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Short Bio:



Chao Liu finished his PhD at Sichuan University in China in 2016. He has published 60 high-level SCI papers, approved the authorization of 30 Chinese Patents, applied for one U.S. Patent and four international PCT patents, and published one of the first academic monographs in this field as a co-author (*Liquid Photonic Devices*). His recent research interests are adaptive optofluidic lens, optical system design, and information displays.

