

# High-Speed Parallel Axial Imaging Using an Array of Micro-Mirrors

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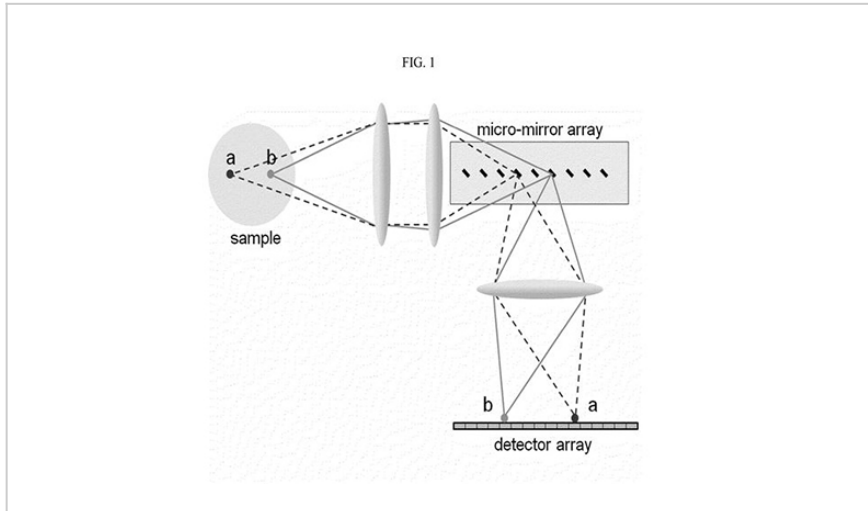


Diagram of z-microscopy

## Technology Summary

The present invention provides methods for parallel axial imaging, or z-microscopy, utilizing an array of tilted micro-mirrors arranged along an axial direction of a probe. The micro-mirrors are placed at 45° angles with respect to the axial direction. These image signals emitted from different axial positions can be reflected by corresponding micro-mirrors and spatially separated for parallel detection, essentially converting the more challenging axial imaging to a lateral imaging problem. Numerical studies have shown that nearly diffracted limited axial resolution can be obtained by z-microscopy.

## Application & Market Utility

In conventional optical microscopy, there is a disparity in lateral and axial imaging speed. An image in the x-y plane can be acquired at high speed, but slow scanning of the objective lens hinders the z-direction. Novel techniques have been proposed to improve imaging speed (multi-focal, holography), but these techniques lack optical sectioning capability. The present invention improves z-direction imaging speed while maintaining sectioning capability and can reach nearly diffracted limited axial resolution. This technology is protected by the U.S. 9,547,163 patent.

## Next Steps

Seeking research collaboration and licensing opportunities.

TECHNOLOGY READINESS LEVEL

4-7

### Seeking

Investment | Licensing | Research

### Keywords

- optical microscopy
- axial imaging
- high speed imaging
- micro-mirror array
- z-microscopy

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