

## Systems and Methods for Performing Quantitative Phase-Contrast Confocal Microscopy

**R**esearchers at the University of South Florida have developed novel systems and methods for obtaining quantitative phase-contrast imaging using line-scanning confocal microscopy.

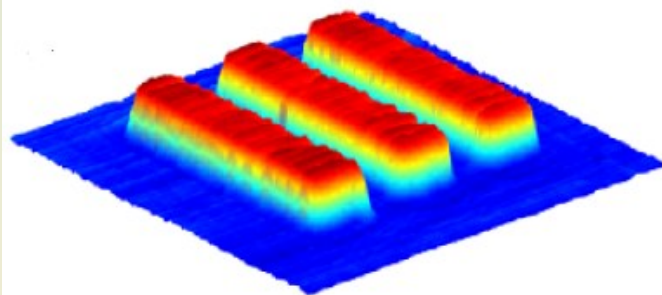
Point-scanning confocal microscopy has proven to be successful for noninvasive imaging of thin sections within thick biological samples with high resolution and contrast. Unfortunately, the speed at which images are captured using point-scanning is limited. Because of this limitation, line-scanning confocal systems have been proposed to increase the speed with which images can be acquired. Such systems have been successfully tested in industrial inspection, imaging of human tissues, and ophthalmology. Despite these advantages of line-scanning confocal microscopy, it can only capture intensity information and cannot be used to capture the quantitative phase information of the optical field. Hence it is desirable to be able to capture both intensity and phase information using line-scanning confocal microscopy.

Inventors at USF have developed systems and methods that can be used to capture high-quality intensity images of optical sections and obtain a quantitative phase map for each optical section at a high speed. This is achieved by combining the merits of line-scanning confocal systems with digital holography imaging. This invention has applications in industrial inspection and biomedical imaging.

### ADVANTAGES:

- Captures phase information of the optical field
- Speed of capturing the images is high
- Used to measure surface roughness
- Line scanning is simpler and faster compared to point scanning

*Capture Both Intensity and Phase Information*



*Three-Dimensional Pseudo-Color Rendering of Phase Map*

Tech ID # 14A089

Patent #: [10,082,653](#)