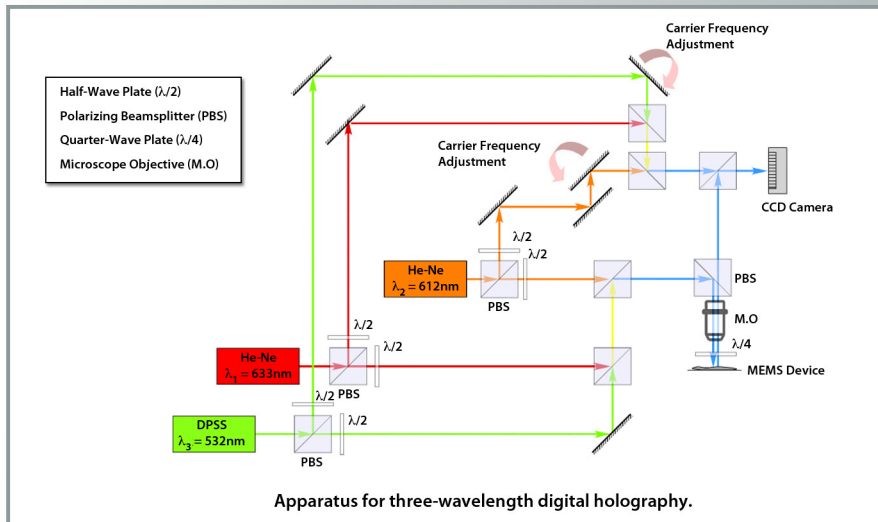


Real-Time High Resolution Quantitative Imaging by Three Wavelength Digital Holography

UT-B ID 200802150



Technology Summary

An optical system capable of reproducing three-dimensional images was invented at ORNL. This system can detect height changes of a few nanometers or less and render clear, single shot images. These types of precise, high speed measurements are important for a variety of nanoscience applications.

Imaging offers a compelling alternative to convention scanning because it is faster and does not require a contact point. This invention uses a three wavelength approach to address the challenge of sufficiently high resolution imaging over time. The device quantitatively determines the position of points on or within an object and can update images as the same rate data is received or match a user's perception of real time.

The invention may be used to measure the deformation of any micro- or nano-electromechanical systems (MEMS or NEMS) device by making direct, long-range shape measurements of dynamically moving samples quickly with high resolution.

Advantages

- Real-time acquisition
- High speed
- High resolution
- Long-range shape measurements of moving samples

Potential Applications

- Deformation measurements of MEMS or NEMS devices

Patent

Christopher J. Mann and Philip R. Bingham, *Real-Time High Resolution Quantitative Imaging by Three Wavelength Digital Holography*, U.S. Patent Application 12/381,758, filed March 16, 2009.

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