



Inventors

Rodolfo E. Díaz

Research Assistant
Professor

Department of Mechanical
and Aerospace
Engineering

Ampere Tseng

Professor

Department of Mechanical
and Aerospace
Engineering

Karl Booksh

Assistant Professor

Department of Chemistry

José Menéndez

Professor

Department of Physics

Michael Wagner

Assistant Professor

Department of Computer
Science and Engineering

Sethuraman Panchanathan

Associate Professor

Department of Computer
Science and Engineering

Intellectual Property Status

US Patent 6,980,716

Contact

Bill Loux

Director of Business Development

Arizona Technology
Enterprises, LLC (AzTE)

480.884.1996 main

480.884.1992 desk

Email: bloux@azte.com

Coherent Evanescent Wave Imaging System

AzTE Case # M01-031

Background

Nanotechnology is the study of the control of matter at the atomic and molecular level, and is focused mainly on the creation of materials and equipment to work within that scale. One thing holding back the advancement of this technology is the lack of experimental tools capable of visualizing nanoproceses in real time across their full range of operation. Near-field detection systems, primarily consisting of different Scanning Probe Microscopes, provide the best current option for this type of activity. They have a detection tip that is sensitive to nanoscale changes in its vicinity traverse over a surface to create a topographical map of its properties. However, despite excellent detection rates and resolution, the premise of the method limits its ability to monitor nanoproceses over a long period of time or large space, especially apparent in the domain of radiofrequency.

Invention Description

Researchers at Arizona State University have developed a new imaging technology different from all currently in existence. Through the use of coherent wavefronts and holographic techniques, all common wave imaging methods are viable for nanostructure detection. The subsequent fusion of these images gathered from different sources and wavelengths can produce vivid multi-spectral characterizations and ultimately real time nanoprocess visualization.

Potential Applications

- Nanotechnology Research (nanostructure and process visualization)
 - Medicine
 - Electronics
 - Energy Production

Benefits and Advantages

- More efficient multi-spectral characterizations of nanostructures in real time
- Fusion of multiple images creates the visualization of a nanoprocess over its complete range of operation
- Readily available optical frequency sources and techniques for wave imaging can be employed