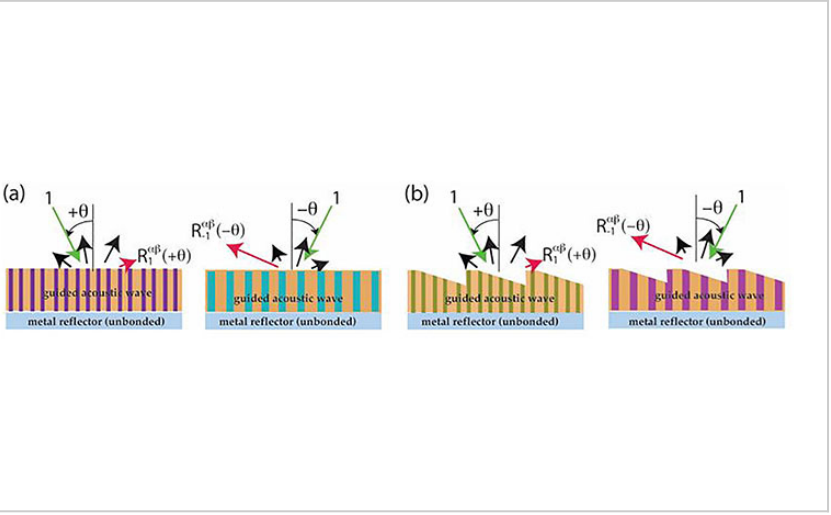
One-way Optical Device for Medical Imaging and Other Applications

ID# 2016-4465



Nonspecular optical reflections

Technology Summary

One-way devices are vital in imaging systems because they help prevent light reflections from affecting the resolution of a picture. In systems using low frequency waves, which have a limited magnification capacity, one-way devices take the form of isolators. However, prior to this invention, one-way devices have not existed in optical imaging techniques. The present invention provides for a system of altering optical reflection via a dynamic control of an ultrasonic/acoustic guided wave field in an acousto-optical transparent plate. The idea is to alter light reflection characteristics by changing the ultrasonic/acoustic field in a plate so that a first optical plane wave impinging from the left quadrant, and a second optical plane wave impinging from the right quadrant may be diffracted differently.

Application & Market Utility

The invention would be the first one-way optical device to exist in an imaging system using the terahertz regime to magnify matter at the nanometer scale. This invention is particularly applicable in bio-medical diagnoses and semiconductor device inspections, wherein sharper 2D and 3D images would be enabled for microscopy and tomography. On-chip implementation could even facilitate integration with electronics and boost hi-fi internet.

Next Steps

Seeking research collaboration and licensing opportunities.

TECHNOLOGY READINESS LEVEL 1-3

Seeking

Investment | Licensing | Research

Keywords

- one-way device
- medical imaging
- microscopy
- tomography
- 2D and 3D imaging

Researchers

Joseph Rose
Paul Morrow Professorship in Engineering Design and Manufacturing
Online Bio

Akhlesha Lakhtakia
Charles Godfrey Binder Professor in Engineering Science
Website

Originating College

College of Engineering

Office of Technology Management Contact

Rokita, Joseph
jjr152@psu.edu
814-863-6336