Method For Mid-Infrared Imaging In Si-Based Cameras Through Non-Degenerate Two-Photon Absorption

Tech ID: 32353 / UC Case 2020-638-0

BRIEF DESCRIPTION

Researchers at UCI have developed a novel method to combine common CCD (charge-coupled device) cameras with mid-infrared (MIR) technology in order to create an affordable and accessible spectroscopic camera for biochemical imaging.

SUGGESTED USES

· Affordable and efficient method for biomedical mapping of tissues, inspection of industrial ceramics, stand-off detection of materials, mineral sensing and environmental monitoring.

FEATURES/BENEFITS

· Addition of near-infrared (NIR) beam (along with MIR) onto CCD chip, renders the CCD camera sensitive to MIR light
· Si-based CCD cameras are far more affordable, available and efficient for MIR imaging systems

TECHNOLOGY DESCRIPTION

Mid-infrared (MIR) spectroscopic imaging is of particular interest for a number of fields including biomedical mapping of tissue, inspection of industrial ceramics, environmental monitoring, etc. However, since MIR cameras are based on low band-gap materials, they are prone to thermally induced electronic noise, which renders them less practical and affordable. For these concerns, development of more affordable cameras could lead to a breakthrough in the MIR imaging field.

The researchers at the University of California, Irvine, invented Si-based charge-coupled device (CCD) camera that utilizes mid-infrared (MIR) technology to permit 3D chemical imaging in biomedical, engineering and environmental settings. The CCD based MIR sensor takes advantage of the non-degenerate two-photon absorption (NTA) process that benefits from a mature Si-detector technology offers a better alternative to current commercial devices.

PATENT STATUS

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<td>Patent Cooperation Treaty</td>
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<td>2021/195273 A1</td>
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Additional Patent Pending

INVENTORS

» Fishman, Dmitry
» Knez, David
» Potma, Eric O.

OTHER INFORMATION

CATEGORIZED AS

» Optics and Photonics
» Imaging
» Medical
» Molecular
» Other
» Security
» Medical
STATE OF DEVELOPMENT

The researchers at UCI have recorded real-time MIR videos of living organisms.

RELATED CASES

2020-638-0

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Method For Liquid-To-Solid Phase Separation Of Uranium And Uranyl Contaminant From Various Solutions
- Method For Rapid In Situ Detection Of Ammonia
- Novel Reflective Microscope Objective Lens For All Colors