INNOVATION PARTNERSHIPS
UNIVERSITY OF MICHIGAN

Dielectric Grating, Narrowband Transmission Filter

TECHNOLOGY NUMBER: 5836

OVERVIEW

- Tunable, highly selective narrowband transmission filters from dielectric gratings
- Applicable to a variety of IR imaging technologies

INNOVATION

Narrowband transmission filters for infrared wavelengths, particularly long wavelength infrared (LWIR), have been difficult to develop and implement. This has in turn limited the use of these longer wavelengths in technologies, such as hyperspectral imaging, remote sensing, and aerospace and aeronautics systems.

Researchers at University of Michigan have developed a new approach to narrowband transmission filters that utilizes dielectric gratings (such as silicon/air gratings). Although resonance grating phenomena have been harnessed previous to build broadband-lossless reflectors and reflection filters, transmission filters have been more elusive. By tuning the simple geometric structure of the grating and introducing a deliberate asymmetry (either in the grating itself or in the angle of incidence of the light beam), the UM researchers have demonstrated this approach with narrowband transmission filters of LWIR. In principle, any wavelength of light may be used.

This type of transmission filter should be useful for a variety of applications, particularly those requiring narrowband transmission within the IR spectrum. The filters may be integrated at the pixel or subpixel level, which may lead to improved and more cost-effective imaging capabilities.

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Category
Materials
Engineering & Physical Sciences

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