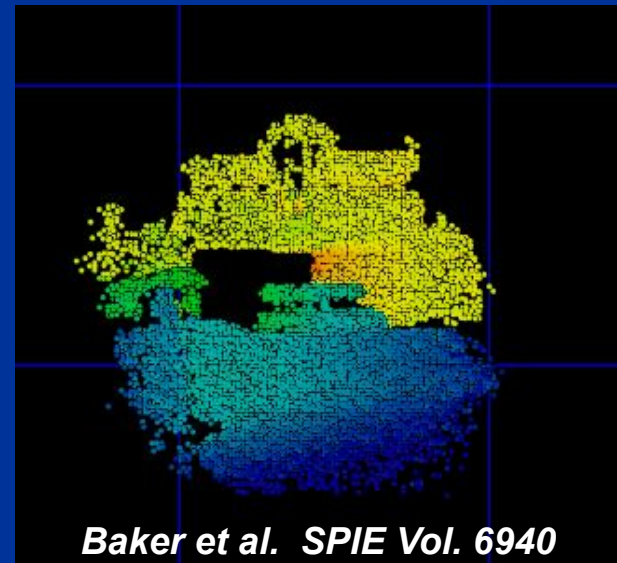


High Gain InAs e-APDS with Excess Noise Factors Approaching a Solid State Photo-Multiplier

- APDs can improve receiver sensitivity by providing signal amplification in the detecting photodiode
- e-APDs provide amplification with minimal noise
- Benefiting applications with fewer photons
 - Active or 3D imaging (short integration times)
 - Hyperspectral imaging (spread spectrum)
 - Range finding
 - CO₂ monitoring
 - Photon counting
- Other benefits
 - Use lower power sources for active imaging
 - Use smaller optics collecting less light



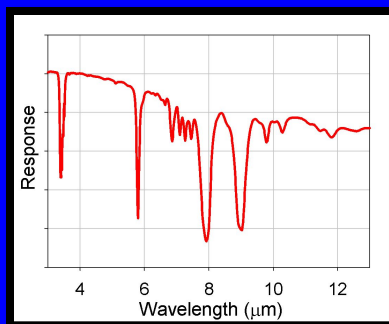


Multispectral and hyperspectral imaging with QDIPs

- Night vision and surveillance

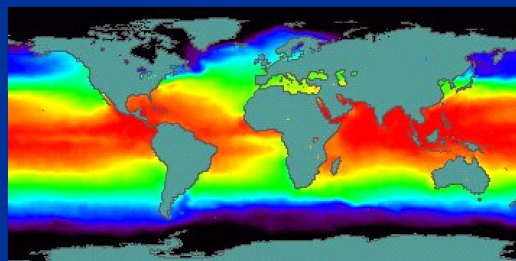


- Chemical/material identification

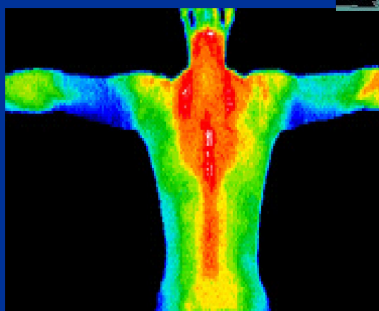


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- Atmospheric monitoring



- Medical imaging

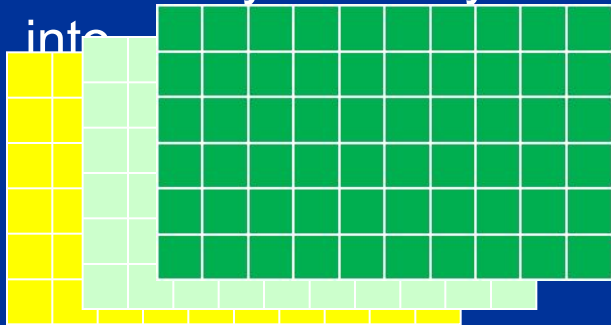


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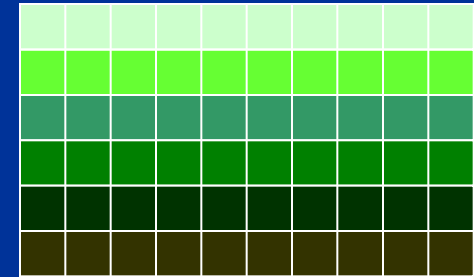


Why Algorithmic spectrometer?

QDIPs are 2 terminal devices.
Can be dynamically configured
into



High resolution
multicolour
FPA



Multispectral : Row-by-row

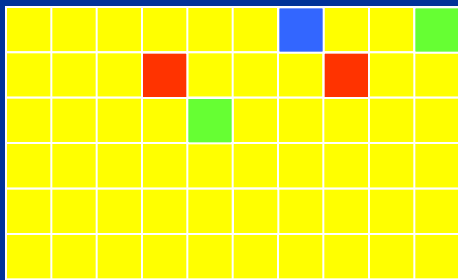
Multispectral : Full
FPA

**Future
Intelligent**

Sensors?

No moving parts

No cooled optical filters needed



Multispectral: Pixel-by-pixel

Conclusion & Questions

- EEE team develop new theories, proof of concepts of novel material and sensing techniques with typical conclusions such as
 - Low strain QDIPs with between 30 and 80 stacks have been grown, dark current results show no strain effects
 - QDIPs can be used with algorithmic spectrometer to image filters in the LWIR and MWIR regions – promising for material classification such as polyurethane e.t.c.
- Is this enough or can we do more?



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