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**Spotlight on “Broadband on-chip near-infrared spectroscopy based on plasmonic grating filter array”**

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**Spotlight summary:**

*Broadband high-resolution spectroscopy: plasmonics makes it cheap on a chip.*

The development of portable, cost-effective solutions for on-site sensing requires spectroscopy systems that use neither expensive nor bulky instruments. On-chip spectrometers are good candidates due to their inherent low cost, but they typically suffer from a limited spectral resolution or operating bandwidth, or they need sophisticated optical coupling methods to couple light into sub-micron-scale waveguides.

In this *Optics Letters* article, R. Li and coworkers effectively exploit the combination of subwavelength gratings with plasmonic nanostructures to realize an ultra-compact, broadband on-chip spectrometer with a very high resolution. The device integrates 28 individual subwavelength plasmonic grating filters in a footprint of less than  $1.5 \text{ mm}^2$ , providing a spectral resolution as high as 10 nm over a near-infrared (IR) operation bandwidth of 270 nm. An accuracy comparable to that of conventional Fourier Transform IR spectroscopy is achieved thanks to a post-processing numerical method compensating for spurious side peaks in the transmission spectrum of each plasmonic filter. The optical transmission pattern of the entire filter array can be also acquired

through a CCD camera, enabling the monitoring of all optical wavelengths simultaneously. Neither moving elements nor critical optical alignment systems are employed, thus improving the system reliability and simplifying measurement operations.

The result is a spectrometer that is ultracompact, cost-effective, broad-band, high-resolution, reliable, robust and easy to use... definitely promising for future portable IR spectroscopy systems.

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