LICENSING OPPORTUNITY: LOW-LOSS METASURFACE OPTICS FOR DEEP UV

DESCRIPTION

Problem

Current technology for manipulating UV light waves is largely based on "conventional" optical elements, whose working principles are based on light refraction or diffraction. These elements suffer from issues including large footprint, complicated (dedicated) manufacturing process, limited functionalities or operational bands (in contrast to their counterparts for the visible and infrared regimes), reduced operational efficiencies towards short wavelengths (e.g., for the deep-UV range), etc.

Invention

In this invention, we employ a novel approach to construct high-performance optical elements operating in the UV, moreover, into the deep-UV regime. Our technology is based on metasurfaces, where we design nanoantennas with sizes of a fraction of the scale the wavelength of UV light, and arrange them over a planar surface. These nanoantennas collectively imprint arbitrary amplitude, phase or polarization manipulations an incident UV light.

BENEFITS

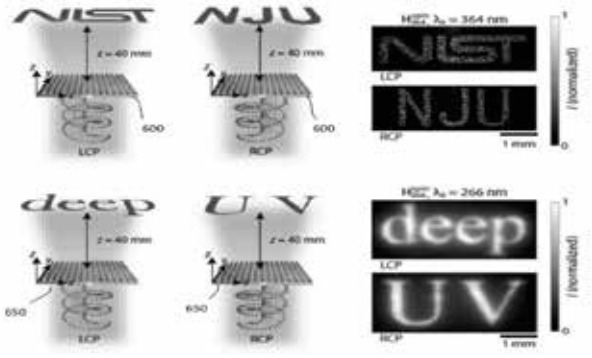
Commercial Application

To date, a technical solution enabling implementation of ultraviolet metasurfaces having with sufficiently low optical loss for commercial applications, had not been available. Our invention fully breaks through the materials and fabrication barrier standing in the way of realizing ultraviolet materials, and offers a practical, commercially scalable method to do so.

Metasurfaces for important markets in the ultraviolet space, such as for imaging, lithography, or quantum clocking and computing, are not yet commercially realizable due to the lack of an available technology to date for implementing such metasurfaces.

Competitive Advantage

This invention opens opportunities for creation of low-loss, multifunctional, and "flat" optical elements for operation in the near-, mid- and deep-ultraviolet regimes, that are ideally suited for integration into compact nanophotonic systems.



Embodiments of spin-multiplexed near- and deep-UV metaholograms.

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