

Resonant Nanostructures for Augmented Reality

Context & scientific challenge

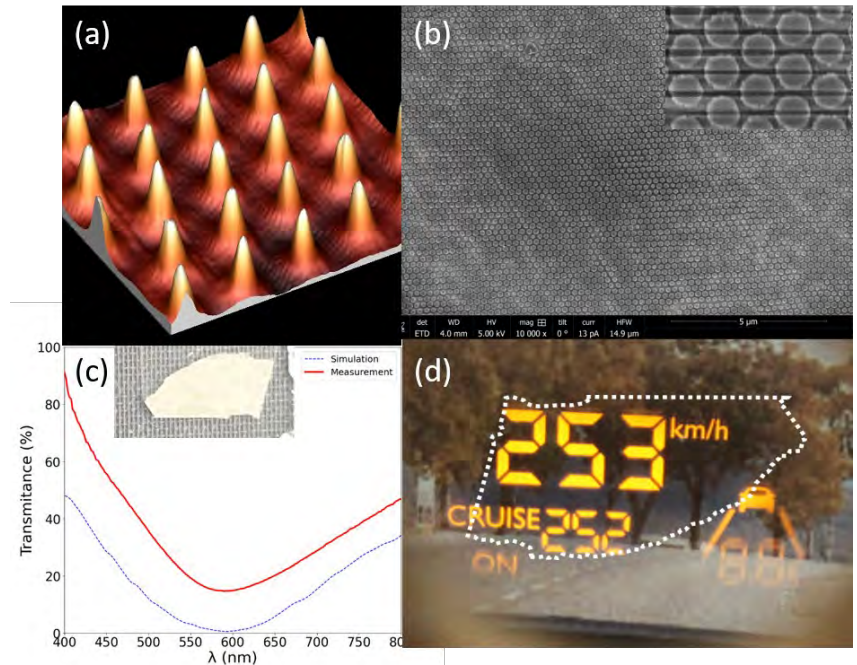
Visualisation systems, and in particular augmented reality, have seen increased use in applications such as automotive head-up displays or head-mounted displays such as Google Glass. Due to the cost and energy constraints of industrial applications, technological solutions are needed to improve the efficiency of these devices. In particular, these systems include a large surface blade that must be both transparent in the visible range and reflective at certain wavelengths. In this context, wavelength-selective reflective metasurfaces are considered good candidates. For the fabrication of large area devices we have developed a process based on nanoimprint based on soft stamps (Soft NIL-UV) to fabricate large areas at low cost. The main improvement is a new technique for the fabrication of PDMS stamps based on the self-assembly of polystyrene nanospheres combined with direct etching of PDMS.

Results

« Improved PDMS mold fabrication by direct etch with nanosphere self-assembly mask for Soft UV-NIL subwavelength metasurfaces fabrication », doi.org/10.1016/j.mee.2022.111755.

Scientific impact & applications

Metasurface, Augmented reality, Heads-up displays (HUDs), Automotive, Defense.



Partnership

Agence de l'Innovation de Defense.

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