Contribution ID: **19** Type: **not specified**

Optical Metasurfaces for Lighting Applications

Thursday 25 May 2023 11:55 (15 minutes)

Light-emitting diodes (LEDs) are used in almost all everyday lighting applications today. They enable light sources to have long lifetimes, low power consumption and high light output, while retaining a relatively compact footprint. However, LEDs emit light of equal intensity in all directions, and thus for many applications require bulky external optics to engineer their intensity distribution. We are exploring a way to retain a compact footprint by replacing these bulky optics with so-called metasurfaces. The metasurfaces consist of arrays of resonant, dielectric nanostructures, which introduce a predesigned phase shift to the light passing through the surface. A crucial step is to design the phase profile of the metasurface for a specific application. As a first step, we present an inverse design method for determining the metasurface phase profile, for shaping the intensity of a collimated incident beam. Our model is based on optimal transport from non-imaging optics and is derived from the generalized law of refraction. Authors Kirstine E. S. Nielsen (presenter), Mads A. Carlsen and Søren Raza.

Presenter: ENGELL SANDAGER NIELSEN, Kirstine (Technical University of Denmark)