

## Plasmonic colour laser printing - DTU Orbit (09/11/2017)

### Plasmonic colour laser printing

Colour generation by plasmonic nanostructures and metasurfaces has several advantages over dye technology: reduced pixel area, sub-wavelength resolution and the production of bright and non-fading colours. However, plasmonic colour patterns need to be pre-designed and printed either by e-beam lithography (EBL) or focused ion beam (FIB), both expensive and not scalable processes that are not suitable for post-processing customization. Here we show a method of colour printing on nanoimprinted plasmonic metasurfaces using laser post-writing. Laser pulses induce transient local heat generation that leads to melting and reshaping of the imprinted nanostructures. Depending on the laser pulse energy density, different surface morphologies that support different plasmonic resonances leading to different colour appearances can be created. Using this technique we can print all primary colours with a speed of 1 ns per pixel, resolution up to 127,000 dots per inch (DPI) and power consumption down to 0.3 nJ per pixel.

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Authors: Zhu, X. (Intern), Vannahme, C. (Intern), Højlund-Nielsen, E. (Intern), Mortensen, N. A. (Intern), Kristensen, A. (Intern)

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