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Tailoring light with digital holograms

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Abstract content
   (Max 300 words)
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Digital holography as an optical technique has been in existence for more than a decade now. With the commercialisation of liquid crystal devices, digital holography as an enabling tool has become accessible to all, and with it all-digital tools for the tailoring of light has finally come of age. In this talk the role of digital holograms in shaping and controlling the spatial patterns of light will be introduced, so-called structured or tailored light. The basic principles of digital holography, implemented with rewritable spatial light modulators, will be discussed for the creation and detection of customised light fields in the laboratory. We will show that this can be done at the many photon and single photon regimes, as well as directly at the source to form a digital laser. Such tools are highly relevant to the in situ analysis of laser systems, to mode division multiplexing as an emerging tool in optical communication, and for quantum information processing with entangled photons. In the process of the talk I give a popular overview of the research currently underway in the Mathematical Optics group at the CSIR National Laser Centre.

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