



Contribution ID: 296

Type: Oral Presentation

Shaping a kaleidoscope of colours

Wednesday, 5 July 2023 10:00 (20 minutes)

Since the late 1990s, laser beam shaping has experienced a surge in activity. With the use of modern digital tools, one has the power to tailor light in its many degrees of freedom (polarisation, amplitude and phase) to create so-called 'structured light'. In recent years we have seen structured light used in various fields such as optical communication, information processing, detection, imaging and even industrial manufacturing. With advancements in the various fields, the demand for broadband structured light has increased as it offers an additional degree of freedom to manipulate. In the past decade modulation of multiple wavelengths has been achieved with devices such as spatial light modulators (SLMs). However, these devices are polarisation dependent, costly and have slow response rates- making it unsuitable for many commercial uses. Digital micromirror devices (DMDs) on the other hand are polarisation and wavelength independent, compact, cheaper and have an extremely fast response rate. In this work we show how broadband beam shaping can be achieved by adding a single lens after the DMD and observing the beam in the image plane. The experimental results correlate well with the theory, thus validating the approach. In this way, we offer a simple cost-efficient and versatile tool for the modulation of broadband or in theory any desired wavelength of light.

Apply to be considered for a student ; award (Yes / No)?

Yes

Level for award;(Hons, MSc, PhD, N/A)?

MSc

Primary author: Ms PERUMAL, Leerin Michaela (University of the Witwatersrand)

Co-author: FORBES, Andrew (U. Witwatersrand)

Presenter: Ms PERUMAL, Leerin Michaela (University of the Witwatersrand)

Session Classification: Applied Physics

Track Classification: Track F - Applied Physics