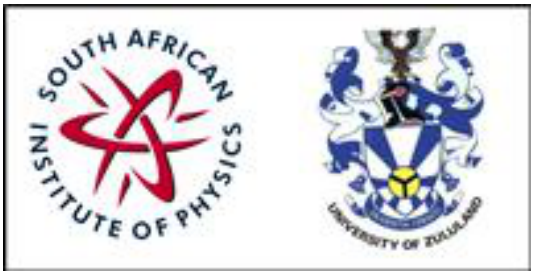

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The effect of SLM dependent dispersion on spatial beam shaping

Wednesday, 10 July 2013 14:30 (20 minutes)

Abstract content
   (Max 300 words)

Spatial light modulators (SLM) used for spatial modulation of lasers are often used in conjunction with very narrow bandwidth laser light where diffractive dispersion could be approximated as a constant. It is known that diffractive dispersion is inversely proportional to wavelength and this effect can be compensated for depending on the optical set-up. SLMs use birefringent liquid crystal pixels each with adjustable refractive index at a specific polarization. The range of the adjustable refractive index is wavelength dependent. This adds an additional SLM dependent dispersion effect when using SLMs. Note that we distinguish between diffractive dispersion and SLM dependent dispersion. SLMs are therefore calibrated in order to have linearly adjustable phase retardation of light incident on the pixels between zero and two pi for a specific wavelength. It is therefore unavoidable when using the same SLM, to do beam shaping of a source which emits multiple wavelengths or a wide bandwidth, that the device will not modulate all wavelengths between zero and two pi. We numerically and experimentally investigate the effect of SLM dependent dispersion on spatial modulation of light incident on a 2D SLM. We further show that it is possible to modulate multiple wavelengths between zero and two pi despite the SLM dependent dispersion.

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