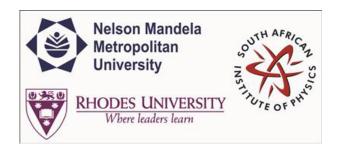
## **SAIP2015**



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## Fundamental Laguerre-Gaussian (LGp0) mode with lower output power threshold

Thursday, 2 July 2015 15:00 (20 minutes)

## Abstract content <br/> &nbsp; (Max 300 words)<br/> dry-<a href="http://events.saip.org.za/getFile.py/starget="\_blank">Formatting &<br/> &classed chars</a>

Intra-cavity generation of fundamental Laguerre-Gaussian modes using a Hamamatsu spatial light modulator (SLM) as a flat-end-mirror. The digital hologram was encoded with an amplitude ring mask, which also contains an aperture of radius r. A curved mirror with a radius of curvature of R=400 mm and reflectivity of 98 % was used as an output coupler. For the design of the optical cavity the length of the cavity was precisely choose to be 173 mm, Nd:YAG of 25 mm as a gain median pumped by a diode laser of 808 nm wavelength was used, resulting in output wavelength of 1064 nm. Laguerre-Gaussian modes of radial order (p), from 0 to 4, were generated and considered for analysis. By digitally controlling LGp0 modes by using an amplitude mask made up of p absorbing rings with ring radii selected with zeros of the desired Laguerre-Gaussian mode. It was found that the laser efficiency for p=1 is the same, regardless of divisions of rings generating these modes (LGp0). In addition, lower output power threshold is recorded, when the ring(s) is(are) divided in parts N. This work demonstrate ease of generating LGp0 modes, with an aim of having a lower laser output power threshold, by dividing absorbing rings into parts.

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