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Multiplexing of a densely-packed set of spatial modes

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Structured or custom optical fields have become useful tools for research and other technological applications. Of particular interest in many of these applications is the simultaneous generation of multiple beams (multiplexing). Technological advances have provided computer-controlled devices capable of generating a great variety of beam shapes that can be multiplexed and controlled individually. In principle, the number of multiplexed beams can be infinite, limited only by the resolution of the generating device. Ultimately, this limitation translates in the decay of the beam quality, a disadvantage that has not yet been fully explored. Here, we investigate on the beam quality as function of the number of multiplexed modes to provide an upper bound to the maximum number of modes that can be multiplexed on a spatial light modulator with a resolution of 1920 × 1080. To find an upper bound we computed the correlation between the experimentally and theoretically generated modes as function of the number of multiplexed modes. These results can be of potential interest in the context of classical and quantum optical communication and optical trapping.

Apply to be
 considered for a student
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Yes

Level for award
 (Hons, MSc,
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PhD

Main supervisor (name and email)
and his / her institution

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Would you like to <br> submit a short paper <br> for the Conference
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No

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