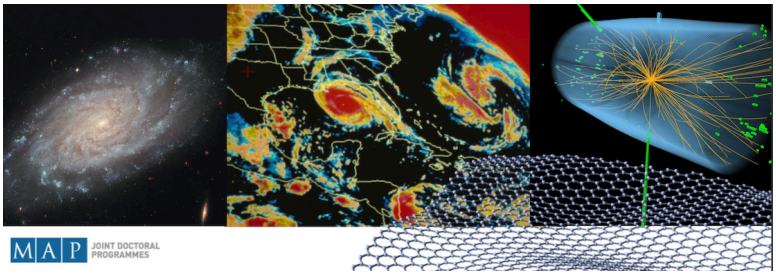

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Selective higher order mode excitation in a nanoprinted hollow square-core waveguide

Friday 11 October 2024 14:50 (20 minutes)

Tailoring the excitation of higher order modes (HOM) is of great importance across several applications within the photonics field, including optofluidics sensing, nonlinear phenomena generation, imaging, and in fiber communication systems. Nevertheless, effectively exciting specific HOM still remains a challenge.
Currently, HOM can be achieved resorting to certain optical devices such as spatial light modulators and modal couplers. However, these devices are not fully integrated in the waveguide, which can impose some drawbacks such as difficult coupling and the requirement of high precision in the alignment.
With the recent advancements in the 2-photon polymerization (2PP) printing technology, a novel methodology for the excitation of HOM can be explored. The figures of merit of this method rely on the capability of designing extremely smooth structures at a nanoscale, and with a very high detail accuracy. Thus, new platforms based on a waveguide integrated modulator are being pursuit.

Within this context, we present a reliable and highly reproducible method to effectively exciting HOM. Resorting to the 2PP technology, a nano-phase plate integrated into a nanoprinted hollow square core waveguide is proposed. The 580 nm thick phase plate is configured in two different designs, inducing the excitation of the LP11 and LP12 modes.

Which topic best fits your talk?

Optics and Photonics

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