

TWO-DIMENSIONAL SURFACE EMITTING PHOTONIC CRYSTAL LASER WITH HYBRID TRIANGULAR-GRAPHITE STRUCTURE

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Laser emission of a compact surface-emitting microlaser, optical pumped and operating at 1.5 μm at room temperature is presented. The two-dimensional photonic crystal (PC) is conformed in a hybrid triangular-graphite lattice [1] designed for vertical emission. The structures have been fabricated on InP slabs including four InAsP quantum wells, a SiO_2 bonding layer, and a bottom high index contrast Si/SiO₂ Bragg mirror deposited on a Si wafer [2]. Standard techniques of electron-beam lithography and reactive ion-etching have been used for the patterning. The optical characterization was performed by microphotoluminescence spectroscopy. Laser emission (see Fig1: Right) has been achieved with high quality factors around $Q \sim 4000$.

[1] L. J. Martínez et al., Optics Express **12**, 23, pp 5684 (2004)

[2] B. Ben Bakir et al., Applied Physics Letters **88**, 081113 (2006)

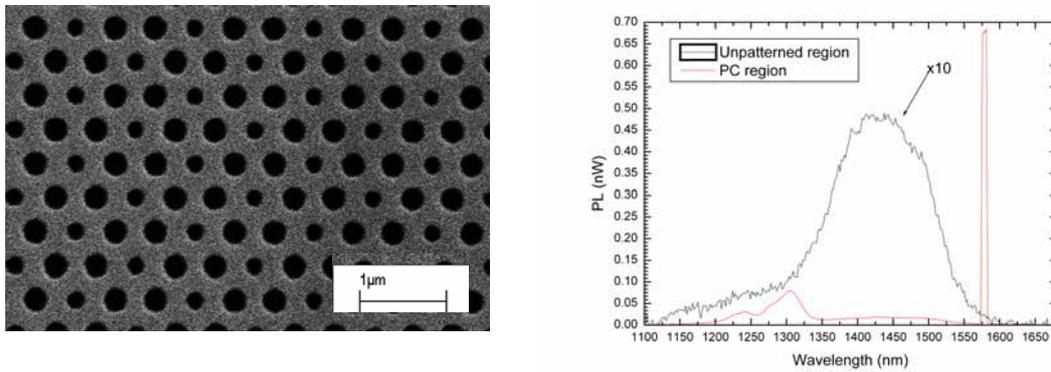


Fig.1. Left panel: SEM micrograph of the fabricated hybrid triangular-graphite structure. Right: Room-temperature photoluminescence spectra at of the PC structure (red line) and of the unpatterned sample (black line).