

Fine mechanisms in photonic crystal multimode waveguide demux

H. Benisty^(a), L. Martinelli^(a), O. Khayam^(a), G.H. Duan^(b),

(a) Institut d'Optique Graduate School, Univ Paris Sud, CNRS, Campus

Polytechnique, RD 128, Palaiseau, F-91127, France

(b) Alcatel-Thales 3-5 Lab, RD 128, Palaiseau, F-91767, France

The recently introduced photonic crystal (PhC) demultiplexing device of Ref.1 is analysed in depth for the single section case and for multi-section cases. The analysis of dropping efficiency through Mini-Stopbands (MSB) by Coupled Mode Theory (CMT) is confirmed in its several aspects (spectral, spatial, angular) by experiments carried out in the "internal light source"(ILS) arrangement. Design rules, including the "desirable" lateral extraction losses, are refined correspondingly, leading to -15dB to - 20 dB interchannel cross-talks, notably using effective "dead zones" inserted along the device sections.

The capability of the device inserted in various III-V integration schemes for wavelength monitoring or full channel demultiplexing is discussed. Time allowing, we will discuss recent selective schemes in even broader PhC waveguides, adapted to Coarse-Wavelength Domain Multiplexing (CWDM).

We acknowledge the support of the EU project 04582 FUNFOX.

[1] E. Viasnoff-Schwoob, C. Weisbuch, H. Benisty, C. Cuisin, E. Derouin, O. Drisse, G.-H. Duan, L. Legouézigou, O. Legouézigou, F. Pommereau, S. Golka, H. Heidrich, H. J. Hensel, and K. Janiak, *Appl. Phys. Lett.*, **86**, 101107 (2005).