Beamsplitters based on air hole photonic crystals and ridge waveguides

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Beamsplitters for power or polarisation separation for photonic integrated circuits have been realised using air hole 2D photonic crystals in association with semiconductor ridge waveguides, in a compact configuration (less than 10 µm ×10 µm).

Efficiency of more than 99 % has been obtained for the power splitter from 3D FDTD simulations (fig. 1, inset), with the light being splitted in the two output branches, either equally, or unequally. Measurements carried out on structures realised on SOI (fig. 1) show efficiency around 80 %.

Polarisation splitters have also been realised in a similar configuration (with 3 rows of holes) and a 13 dB contrast, between TM and TE in one output branch, has been measured.

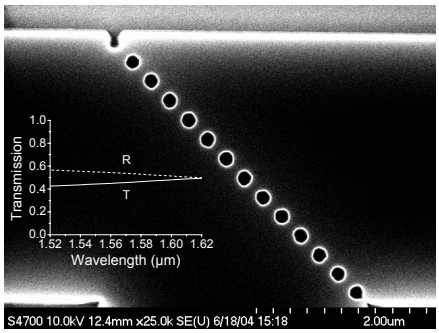

Fig. 1: Transmission spectrum (TM) in branches T and R (inset) and SEM picture of a photonic crystal power splitter, consisting of one row of holes, on a ridge waveguide T-junction