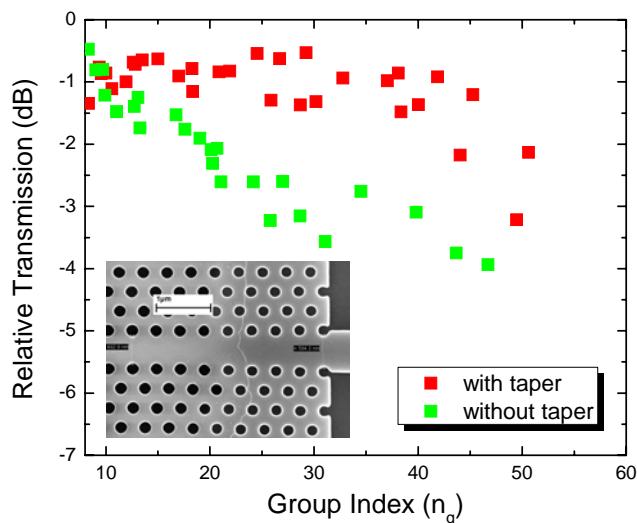


Coupling into slow light regime of photonic crystal waveguide by tapering local group index

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Slow light regime of the photonic crystal waveguide is being investigated extensively due to potential applications in optical delay lines, low light level non-linear optics, and miniaturization of photonic devices [1, 2]. Here we show that by tapering the local group index at the strip and photonic crystal (PC) waveguide interface, the coupling loss between the strip and PC waveguides can be largely reduced in slow light region.



The photonic devices used in this experiment are Mach-Zehnder interferometers with one of the arms consisting of a 200 μ m long PC waveguide. The group Index is determined by measuring the periods of the interference fringes in the transmission spectrum.

Fig. 1. MZI transmission as a function of group index
Inset: strip/PC waveguides interface showing the tapered group index region

[1] Yu. Vlasov, M. O'Boyle, H. Hamann, and S. J. McNab, *Nature*, **438**, 65 (2005).

[2] Yu. Vlasov, and S. J. McNab, *Optics Letter*, **31**, 50 (2006).