

Double pulses generator by an asymmetric Mach-Zehnder Interferometer

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We developed the double pulses generator consisting of an asymmetric Mach-Zehnder interferometer (Fig. 1) in a 2D slab PhC for a coherent control of quantum states. Here, it is important to prevent loop shape path. For this purpose, we use asymmetric Y-branches¹ (Fig. 2). The experimental transmission spectra of the device with various differences of path lengths (ΔL) are shown in Fig. 3. The vibration cycles of the spectra relate to the delay time of generated double pulses. The estimated delay time is about 0.0075~0.012[ps] per $\Delta L=a(=455[\text{nm}])$. We can select the delay time freely by choosing appropriate ΔL .

[1] R. Wilson, T. J. Karle, I. Moerman and T. F. Krauss, J. Opt. A: Pure and Appl. Opt. 5 S76 (2003).

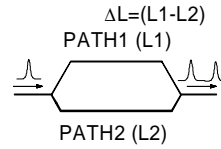


Fig.1: Schematics of a device structure

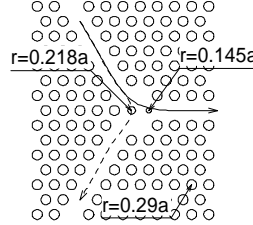


Fig.2: Schematics of an asymmetric Y-branch

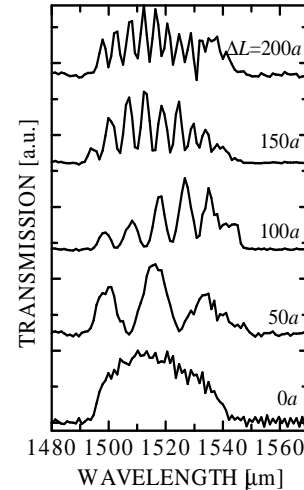


Fig. 3: Transmission Spectra of fabricated devices.