

Thermooptic bistability of AlGaAs-based photonic crystal microcavities

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Optical bistability in photonic crystal (PhC) microcavities has attracted recent interest because it would enable optical flip-flop gates with low power consumption. We have fabricated PhC cavities with AlGaAs [1] with Al-fraction of 0.27. An L3 cavity coupled with a W1 waveguide exhibits a resonance with a Q-factor of 26,000 around a wavelength of 1.55 μm . A jump in transmission occurs at an input power of 4 μW . It has turned out that a simple 1D etalon model cannot explain the large on-off ratio.

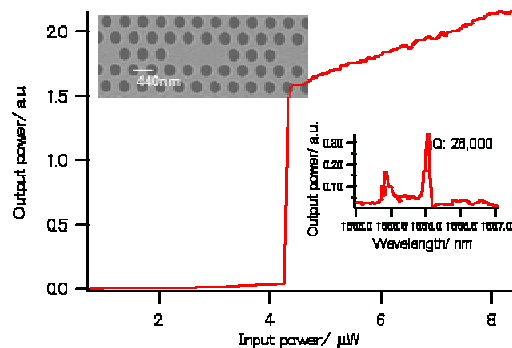


Fig.1 A jump in transmission. Insets are a SEM image of the PhC cavity and the spectrum of the cavity resonance.

[1] Y. Tanaka et al., IEEE Photon. Technol. Lett., **18**, 1996 (2006).