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# All-optical photonic-crystal encoder capable of operating at multiple wavelengths

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**Abstract:** An all-optical photonic-crystal-based encoder is proposed. The device is composed of two ring resonator waveguides with three input-port waveguides and two output-port waveguides in triangular-lattice photonic crystals. Transmission behaviors of the proposed device are verified by two-dimensional finite difference time domain method. The encoder can operate at various wavelengths such as 1.31, 1.49 and 1.55  $\mu\text{m}$ , considering definitions of logic 0 and 1 being the normalized transmission as less than 5% and greater than 80%, respectively.

**Keywords:** photonic crystal, waveguide, ring resonator, encoder

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