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Editor's Summary

16 July 2009

Photon manipulation

In photonic crystals, suitable variations of the refractive index with a periodicity comparable to the wavelength of the light passing through gives rise to so-called photonic bandgaps, energy (frequency) ranges where the photons cannot propagate. Photonic bandgap materials are candidates to provide the necessary tools for guiding and manipulating photons in optical circuits. So far, the basic approaches for photonic control have been based on embedding artificial defects and light emitters inside these three-dimensional materials. Kenji Ishizaki and Susumu Noda now demonstrate experimentally that, in fact, the surface of such photonic materials support two-dimensional (photonic) surface states that can be easily manipulated to control photons (by guiding and trapping, for instance), thus providing a new and versatile approach for the manipulation of photons in these materials.

NEWS AND VIEWS

Photonics: Light control at will

Microchips that make use of light instead of electrons could outperform their electronic counterparts if light flow can be controlled at will. Photonic crystals are instrumental in achieving such a manoeuvre.

Sajeev John

doi:10.1038/460337a

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LETTER

Manipulation of photons at the surface of three-dimensional photonic crystals

Kenji Ishizaki & Susumu Noda


doi:10.1038/nature08190

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