

Selected Abstracts from Other Physical Review Journals

Abstracts of papers that are published in other Physical Review journals and may be of interest to Physical Review A readers are printed below.

Dielectric structures with bound modes for microcavity lasers.

P. M. Visser, K. Allaart, and D. Lenstra, *Vrije Universiteit Amsterdam, De Boelelaan 1081, 1081HV Amsterdam, The Netherlands*. (Received 21 November 2001; published 29 April 2002)

Cavity modes of dielectric microspheres and vertical cavity surface emitting lasers, in spite of their high Q , are never exactly bound, but have a finite width due to leakage at the borders. We propose types of microstructures that sustain three-dimensionally bound modes of the radiation field when dissipation is neglected. Unlike photonic crystals, the photonic systems that we consider here rely on periodicity in only one or two dimensions. In particular, we discuss a cavity composed of two crossed vertical layers combined with a periodic structure of horizontal layers. The layers have an anisotropic dielectric tensor, which could be obtained by making air holes in the vertical and horizontal directions within isotropic material. We calculate cavity resonance frequencies and spontaneous emission rates. The simplicity of this laser geometry allows an analytical study of light propagation and amplification in three dimensions. [Phys. Rev. E **65**, 056604 (2002)]

Tilted wave emission in optical parametric oscillators induced by a bichromatic pumping.

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Tilted wave emission is found in a mean-field model of a degenerate optical parametric oscillator pumped by a bichromatic field with a frequency offset much smaller than the cavity free-spectral range. Tilted wave emission arises due to a nonadiabatic mechanism induced by the slow pump modulation, and disappears when either one of the two pump waves is blocked. [Phys. Rev. E **65**, 057205 (2002)]