

Abstract Submitted
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Control of complete bandgap in two-dimensional photonic crystals with open veins¹ TZONG-JER YANG, Department of Electrophysics, National Chiao Tung University, Hsinchu, Taiwan 300, WENG-LONG LIU, Department of Electrophysics, National Chiao Tung University, Hsinchu, Taiwan 300, BEN-YUAN GU, Institute of Physics, Academia Sinica, P.O. Box 603, Beijing 100080, China — Two-dimensional photonic crystals of a square lattice with square dielectric rods growing thin (6.5% lattice constant) veins on the middle side of each square dielectric rods in air are proposed. Band structures are calculated by the plane-wave expansion method. The complete photonic band gap (PBG) is found in higher frequency band. Then growing thin veins, this PBG is gradually disappeared. At certain length of thin veins, a complete PBG starts to appear in a lower frequency band. But the greatest complete PBG can be gotten while veins are not connected at the boundary of the unit cell of the lattice. The reason of this finding will be given in this report. Our results may provide a new direction for designing PBG of two-dimensional photonic crystals.

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