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标题: Modified annular photonic crystals for enhanced band gap properties and iso-frequency contour engineering
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摘要: In this paper complete photonic bandgap (PBG) and iso-frequency contours (IFCs) of two-dimensional modified annular photonic crystals (MAPC) for four different configurations are numerically studied and calculated by applying plane wave expansion method. The effects of opto-geometric parameters of the designed unit-cell structures are clearly demonstrated in terms of opening frequency gaps and appearing tilted band curves. Optimal structures with large PBGs are reported. The absolute gap can be increased to a maximum value of Delta omega/omega = 0.1766(2 pi c/a), where a is the lattice constant and c is the speed of light. The incorporation of additional parameters inside the unit cell of photonic crystal enables an extra degree of freedom for controlling the flow of light even in the absence of structural defects. The finite-difference time-domain method is utilized to depict the MAPC's light deflection and guiding characteristics. These proposed structures are likely to be promising candidates for applications that require polarization insensitivity due to providing large complete PBGs and possessing special IFCs. (C) 2012 Optical Society of America
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