

عنوان مقاله:

Temperature Tunability of Dielectric/ Liquid Crystal / Dielectric Photonic Crystal Structures

محل انتشار:

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خلاصه مقاله:

Recently, photonic crystals doped with liquid crystal (LC) material have gained much research interest. In this article new ternary one-dimensional photonic crystal introduced and studied. The liquid crystal layer of Δ CB and Δ PCH is sandwiched by two dielectric layers. For the first time, we use four structures $\text{SiO}_2/\text{UCF}_{35}/\text{CaF}_2$, $\text{SiO}_2/\Delta\text{CB}/\text{CaF}_2$, $\text{NFK}_{51}/\text{UCF}_{35}/\text{NPSK}_{53}$ and $\text{NFK}_{51}/\Delta\text{CB}/\text{NPSK}_{53}$. The effect of temperature on transfer band gap of these photonic crystals is investigated with transferred matrix method. The results show that in all four structures PBG for extraordinary ray (ne) is very large than ordinary ray (no) and with increasing of temperature, PBG shifts to red wavelength. PBG width is very vast and variation of the figure with respect temperature is very sharp for $\text{SiO}_2/\text{UCF}_{35}/\text{CaF}_2$ structure. Also, the suggested design takes high tunability due to the infiltration of the LC material. One can use the proposed structure

کلمات کلیدی:

Photonic Crystal, liquid crystal, temperature sensing device, ternary one-dimensional

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