

# A MULTI-CHANNEL OPTICAL FILTER BY MEANS OF ONE DIMENSIONAL N DOPED SEMICONDUCTOR DIELECTRIC PHOTONIC CRYSTALS

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In this paper, I have designed a multi-channel optical filter through a broad band of IR regions using one dimensional n doped semiconductor dielectric photonic crystals. The modeling is essentially based on the plasma model and the characteristic matrix method. The numerical results investigate the significant effect of the doping impurity concentration on the permittivity of the semiconductor layer. Thus, the transmittance characteristics of my design could be significantly controlled by means of such parameter. The role played with some parameters such as the thickness of the semiconductor layer, the thickness of the dielectric material and the index of refraction of the dielectric material on the transmittance properties of the proposed filter is considered here. The designed structure may be useful in the field of photonics and the optical communications as a multi-channel optical filter especially through a broad band of IR regions.

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