

激光技术

用特征矩阵法研究一维激光全息光子晶体的禁带特性

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摘要 介质中传播方向相反的2束激光干涉可形成具有一维周期结构的体积全息图,而这种全息图可以看作一维光子晶体,称为一维激光全息图光子晶体,用特征矩阵法研究了一维激光全息图光子晶体的透射谱中的禁带随入射角、记录波长、介质折射率、折射率调制度的变化规律。结果表明:当入射角变大,激光波长、介质折射率及介质折射率调制度变小时,禁带的位置向短波方向移动,禁带宽度减小。

关键词 [激光全息图](#) [一维光子晶体](#) [特征矩阵](#) [透射谱](#) [禁带](#)

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Investigation into forbidden band characteristic of 1-D laser holographic photonic crystal with eigen matrix

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Abstract Since the interference of two laser beams propagating in opposite directions in a medium can form a 1-D periodic structure volume hologram which can be taken as 1-D photonic crystal or 1-D laser holographic photonic crystal, the dependent relationship of the forbidden band on incident angle, recording wavelength, medium refractive index as well as modulation of refractive index in the transmission spectrum of 1-D laser hologram photonic crystal was investigated with eigen matrix. The results show that the forbidden band moves towards the short wavelength and its width decreases as the incident angle increases or the laser wavelength, the refractive index of medium and the modulation of refractive index decreases.

Key words [laser hologram](#) [one-dimensional photonic crystal](#) [eigen matrix](#) [transmission spectrum](#) [forbidden band](#)

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