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[本期目录](#) | [下期目录](#) | [过刊浏览](#) | [高级检索](#)[\[打印本页\]](#) [\[关闭\]](#)**论文****基于粒子群优化算法的膜系设计方法**

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摘要:

粒子群优化算法是一种新的演化计算技术,与遗传算法相比,粒子群优化算法具有易于实现,控制参量少等优点,且在大多数的情况下,可快速收敛于最优解.为了获得更优的膜系结构,本文提出了一种利用粒子群优化算法进行膜系设计的方法,并以增透膜、高反膜及分光膜为优化设计实例验证该方法的可行性.在这些实例中,以理论反射率和实际反射率的误差平方和为评价函数.结果表明,将粒子群优化算法用于膜系设计是有效的,在相同设计条件下,应用粒子群优化算法可以得到比遗传算法更优的膜系结构.

关键词: 光学薄膜 膜系设计 优化设计 粒子群优化算法 遗传算法

A Coating Design Method Based on Particle Swarm Optimization

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Abstract:

Particles swarm optimization is a new evolutionary computation technique. Compared with genetic algorithm, the particles swarm optimization has the advantages of easy implement, few control parameters, and fast convergence to optimal solution in most cases. In order to obtain better multilayer coating structure, the particles swarm optimization is proposed for the design of optical multilayer coatings. To verify the feasibility of the method, three different design examples, i.e., anti-reflection film, high-reflection film and beam-splitting film, were demonstrated. In the examples, the sum of squared error of ideal reflectivity and actual reflectivity was used as the merit function of multilayer coating performance. The results indicate that the particles swarm optimization is an effective technique for the design of multilayer coatings. By means of particles swarm optimization, a better multilayer coating structure than genetic algorithm can be obtained under the same design condition.

Keywords: Optical film Coating design Optimum design Particle swarm optimization Genetic algorithm

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