

论文

全向激光告警系统中窄带滤光片的透射率分析

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摘要:

根据全向激光告警系统的结构特点,阐明了系统中大视场接收和窄带光谱滤波技术之间的矛盾.通过建立法布里-珀罗滤光片的模型,从反射膜的反射率、位相跃变以及间隔层介质所产生的光程差等因素,分析了激光从不同入射角入射时,滤光片具有不同的透射率.给出了激光入射角与透射率之间的关系公式,通过实验验证其有效性.

关键词: 全向激光告警 大视场 窄带滤光片 透射率

Transmissivity for Narrowband Filter in Omni-directional Laser Warning System

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Abstract:

Based on analyzing the structure of omni-directional laser warning system, the contradiction between wide field of view and the narrow-band spectrum filter is expounded. The Fabry-Perot model is set up. And the transmissivity of the filter vary to different incident angle is analyzed from the factors such as reflectivity of the reflective coating, phase jump and optical path difference. The relationship formula of incident angle and the transmissivity is given out, and its validity is verified by experiment.

Keywords: Omni-directional laser warning Wide field of view Narrow-band spectrum filter Transmissivity

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参考文献:

[1] PAN Hui, AI Yong, JIANG Hai-li. Application and analysis of sensors technologies based on laser threat warning [J]. Infrared and Laser Engineering, 2005, 34(2): 132-136.
 潘慧, 艾勇, 蒋海丽. 激光威胁告警中传感器技术的应用与分析 [J]. 红外与激光工程, 2005, 34(2): 132-136.

[2] GE Qiang-sheng, GONG Chi-ku. Research of vehicular laser passive reconnaissance warning system [J]. Infrared and Laser Engineering, 2003, 32(3): 249-251.
 葛强胜, 龚赤坤. 车载激光侦察告警系统的研究 [J]. 红外与激光工程, 2003, 32(3): 249-251.

[3] WANG Yong-zhong. Fish-eye lens optics [M]. Beijing: Science Press, 2006: 42-46, 61-64.
 王永仲. 鱼眼镜头光学 [M]. 北京: 科学出版社, 2006: 42-46, 61-64.

[4] MAO Deng-sen, ZHANG Ji-long. The application of tenuity laser radiation detecting technology in the laser warning devices [J]. Journal of Test and Measurement Technology, 2004, 18(4): 374-377.
 毛登森, 张记龙. 微弱激光辐射探测技术在激光告警设备中的应用 [J]. 测试技术学报, 2004, 18(4): 374-377.

[5] GU Pei-fu, YANG Yu-min, CHEN Hai-xing et al. Interference filters with multiple transmittance

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peaks used for wavelength division multiplexing systems [J]. Acta photonica Sinica, 2003, 32(7): 838-839.

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[6] MACLEOD H A. Thin-film optical filters [M]. ZHOU Jiu-lin, YIN Shu-bai, transl. Beijing: National Defense Industry Press, [M]. 1976: 270-280.

麦克劳德 H A. 光学薄膜技术 [M]. 周九林, 尹树百译. 北京: 国防工业出版社, 1976: 270-280.

[7] FAN Shao-qing, GUO Fu-qiang. Physics optics [M]. Beijing: Beijing Science and Technology University Press, 1990: 71-81.

范少卿, 郭富强. 物理光学 [M]. 北京: 北京理工大学出版社, 1990: 71-81.

[8] LIN Yong-chang, LU Wei-qiang. Optical thin-film theory [M]. Beijing: National Defense Industry Press, 1990: 63-65, 289-293.

林永昌, 卢维强. 光学薄膜原理 [M]. 北京: 国防工业出版社, 1990: 63-65, 289-293.

[9] TAN Jin-fa, ZHANG Quan. Application thin-film optics [M]. Shanghai: Shanghai Science and Technology Press, 1984: 248-250, 349-350.

唐晋发, 郑权. 应用薄膜光学 [M]. 上海: 上海科学技术出版社, 1984: 248-250, 349-350.

[10] GU Zheng-tian, LIANG Pei-hui, LIU Xiao-lin, et al. Influence of glass surface layers on measurement of optical parameters of thin films [J]. Acta Photonica Sinica, 1999, 28(5): 467-472.

顾铮先, 梁培辉, 刘晓林, 等. 玻璃表面层对薄膜光学参量测量的影响 [J]. 光子学报, 1999, 28(5): 467-472.

[11] ZHAO Gang, HAO Qiu-long, QI Wen-zong, et al. Thermal behavior of thin metal films irradiated by ultra-short pulse laser [J]. Acta Photonica Sinica, 2007, 36 (1): 9-12.

赵刚, 郝秋龙, 齐文宗, 等. 超短脉冲激光辐照下金属薄膜的热行为 [J]. 光子学报, 2007, 36 (1): 9-12.

[12] BAI Sheng-yuan, GU Pei-fu, LIU Xu, et al. Optical stability of thin film filters [J]. Acta Photonica Sinica, 2001, 30(5): 576-581.

白胜元, 顾培夫, 刘旭, 等. 薄膜滤光片的光学稳定性研究 [J]. 光子学报, 2001, 30(5): 576-581.

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