

激光技术

阿达玛变换在激光告警技术中的应用

王建宏,王志斌,张记龙

中北大学仪器科学与动态测试教育部重点实验室, 山西太原030051

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摘要 系统信噪比一直是制约激光探测武器性能的关键性因素之一。为提高系统探测信噪比, 利用阿达玛变换方法, 在计算模板大小(17.48×17.48mm)和码元数N=255的基础上, 详细介绍了Sn循环矩阵的生成, 最后选择液晶空间光调制器充当编码模板。通过在液晶面板上不同位置施加不同的电压, 利用旋光效应对通过的激光衍射条纹进行控制, 按其通过与否(1/0)进行编码。在这一方法指导下进行了系统的仿真实验研究并获得成功。实验结果表明: 将阿达玛变换应用于激光光谱测量, 在不增加测量次数的情况下, 可以有效地提高系统的信噪比。

关键词 [Hadamard矩阵](#) [S循环矩阵](#) [编码模板](#) [阿达玛变换](#)

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Application of Hadamard transform in laser alarm technology

WANG Jian-hong, WANG Zhi-bin, ZHANG Ji-long

Key Laboratory of Instrumentation Science & Dynamic Measurement

Sponsored by Ministry of Education, North University of China, Taiyuan 030051, China

Abstract The signal-to-noise ratio (SNR) is always a key factor to limit the development of passive laser detection system. In order to improve the SNR of the system with Hadamard transform, the formation of Sn circular matrix is introduced, and SLM served as the coding templet was selected based on the calculation of the appropriate coding templet size (17.48mm×17.48mm) and code symbol number (N=255). By applying different voltages on different locations of the templet, the transmitting laser diffracted stripes are controlled by magnetic rotation effect, and coded according to if they have passed through or not. The simulated experiment for the system proved that this method is successful. The experiment result indicates that the SNR can be improved effectively without increasing the times of measurement if the Hadamard transform is applied to the measurement of the laser spectrum.

Key words [Hadamard matrix](#) [Sn cyclic matrix](#) [coding templet](#) [Hadamard transform](#)

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通讯作者 王建宏 paohuo1@tom.com

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