

计量测试

现场用激光能量计校准方法的实验研究

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摘要 在激光功率能量测量当中, 军用激光现场检测环境温度和实验室环境温度相差很大, 而激光能量计的传感器灵敏度与环境温度条件有关, 不对激光能量计进行温度灵敏度校准, 将严重影响测量结果。针对目前存在的问题, 本文提出将激光能量计放置于温控制箱中, 脉冲激光器输出的激光经过分光镜分束后分为2束激光, 其中透射光由标准能量计或现场激光能量计接收, 反射光由参考能量计接收, 在-50℃~70℃的温度范围内进行校准的一种新方法, 并进行原理性的验证实验及结果分析, 得到了能量计灵敏度系数关于环境温度的函数关系, 使得能量计在非标准环境下进行准确测量成为可能。为激光能量计现场测试校准技术的研究提供了一种可靠的新途径。

关键词 [能量计](#) [激光功率](#) [计量技术](#)

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Investigation of calibration technology in field for laser energy meter

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Abstract In measurement for laser power and energy, the ambient temperature of military laser measurement in field is different from the laboratory temperature. The sensitivity of laser energy meter sensor is relative to ambient temperature. If laser energy meter is not calibrated for temperature sensitivity, the measurement results will be affected greatly. Aiming at the problem, the paper proposes a new method in which the laser energy meter is put in temperature control box and the output pulsed laser is divided into two beams after beam splitter. The transmitted beam is accepted by standard energy meter or field laser meter, the reflected beam is accepted by reference energy meter and the calibration is done in temperature range of -50℃~70℃. The principle is verified by experiments and the results are analyzed. The function of sensitivity coefficient relative to temperature, which enables the accurate measurement of energy meter under non standard scenario. It provides a new reliable method for the study of calibration technology in field for laser energy meter.

Key words [energy meter](#) [laser power](#) [metrology technology](#)

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