

论文

固体发动机羽烟的激光透过率测试

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摘要:

为获得羽烟对激光透过率的影响,用烟箱法对2种配方的缩比发动机羽烟在1.06μm、10.6μm激光波段的透过率进行测试。采用1.064μm激光调制发射、接收、数据采集系统对1.06μm激光波段烟雾透过率测试;用黑体、光谱辐射计、数据采集系统可测出2μm~13μm的光学透过率,从中提出10.6μm激光波段烟雾透过率,得到不同推进剂配方、不同烟雾浓度情况下10.6μm光波和1.06μm光波的烟雾透过率测试数据。烟箱1.8m烟道上的测试数据表明:配方2推进剂优于配方1推进剂,10.6μm光波的烟雾透过率96%~97%大于1.06μm光波的烟雾透过率92%~93%。

关键词: 固体推进剂; 发动机羽烟; 激光透过率

Laser transmittance measurement technology on plume from solid-propellant engine

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Abstract:

The main performance of hyper-velocity kinetic missile and its solid propellants is described. The mechanism of laser attenuation caused by the plume of solid rocket motor is analyzed. The plume transmittance of two solid-propellant formulations was tested by the aid of a smoke-box when the laser wavebands were 1.06μm and 10.6μm. The plume transmittance in 1.06μm laser was tested with 1.064μm laser modulation emitting, receiving and data acquisition system. The plume transmittance of 10.6μm laser was derived after the optical transmittance of 2μm~13μm laser was tested with the blackbody radiation source, spectroradiometer and data acquisition system. The tested data indicates that formulation 2 is better than formulation 1, and the plume transmittance 96%~97% of 10.6μm laser is higher than that 92%~93% of 1.06μm laser.

Keywords: solid propellant plume of engine laser transmittance

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参考文献:

[1] 莫红军,张海燕.高速动能导弹及超高速导弹用固体火箭推进剂[J].火炸药学报,2005,28(1):1-4. MO Hong-jun,ZHANG Hai-yan.Solid propellants applying for kinetic or hyper-velocity missiles [J].Chinese Journal of Explosives & Propellants,2005,28(1):1-4.(in Chinese with an English abstract)  
[2] 张波,杨坤涛,张南洋生.固体发动机羽烟的激光透过率动态测试[J].激光与红外,2006,36(8):675-677. ZHANG Bo,YANG Kun-tao,ZHANG Nan-yang-sheng.Laser transmittance dynamic measurement technology on plumes of solid-propellant motor [J].Laser & Infrared,2006,36(8):675-677.(in Chinese with an English abstract)

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[3] 姚禄玖, 高均麟, 肖凯涛, 等. 烟幕理论与测试技术 [M]. 北京: 国防工业出版社, 2004.

YAO Lu-jiu, GAO Jun-lin, XIAO Kai-tao, et al. Theory and testing technique of smoke

[M]. Beijing: National Defence Press, 2004. (in Chinese)

[4] 张劲民, 袁华, 何铁山, 等. 烟箱法测试固体推进剂羽烟光学透过率 [J]. 火炸药学报, 2005, 28(1): 12-14.

ZHANG Jin-min, YUAN Hua, HE Tie-shan, et al. Measurement of the signal transmittance of solid propellant plume with smoke-box method [J]. Chinese Journal of Explosives & Propellants, 2005, 28

(1): 12-14. (in Chinese with an English abstract)

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