北京航空航天大学学报 » 2011, Vol. 37 » Issue (11) :1384-1387,1394 DOI:



# 航天火工品爆炸引起的电磁干扰测量

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# Electromagnetic interference caused by aerospace explosives

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**摘要** 通过地面模拟试验测量了火箭分离时火工品的爆炸产生的电磁辐射.通过杆天线和实时频谱仪测量了不同种类的航天火工品的爆炸辐射,表明辐射随着爆炸能量的增加而增强.使用聚能炸药索时,在爆炸分离后的数十毫秒内都会有明显的电磁脉冲出现,其频率主要集中在兆赫兹量级,在单个频点上的电场峰值可达数个V/m.使用偶极子天线对爆炸时舱体内外的电磁环境进行了对比,并对舱内线路上的感应电流脉冲进行了测量,得到了一些初步结论.试验结果可为舱内电子设备的抗干扰设计提供参考.

**关键词:** 化学爆炸 火工品 电磁脉冲 电磁干扰 级间分离

**Abstract:** Simulative experiments on the ground were carried out to measure the radiation by chemical explosion of aerospace explosives in stage separation and evaluate the impaction on the electronics in the rocket. Electromagnetic pulses by different explosives were captured by a rod antenna and measured by a real time analyzer. The results show that radiation increases as the energy of the explosion. When using a mild linear shaped charge,considerable pulses were recorded in dozens of milliseconds after the separation, with the frequencies around megahertz and magnitude about several V/m on single frequency. Electromagnetic environment inside and outside the rocket were recorded and compared by simple dipoles, and current pulses induced on the circuits inside the rocket were also measured. The conclusion could direct the anti-interference design on the inner electronics of launch vehicle.

**Keywords:** chemical explosion explosive electromagnetic pulse electromagnetic interference stage separation

Received 2010-07-12;

Fund:

国家重点基础研究发展计划资助项目(2010CB731800); 国家自然科学基金资助项目(60831001,F010610)

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**引用本文**:

曹景阳, 谢树果, 苏东林, 麻智超.航天火工品爆炸引起的电磁干扰测量[J] 北京航空航天大学学报, 2011,V37(11): 1384-1387,1394

Cao Jingyang, Xie Shuguo, Su Donglin, Ma Zhichao.Electromagnetic interference caused by aerospace explosives[J] JOURNAL OF BEIJING UNIVERSITY OF AERONAUTICS AND A, 2011,V37(11): 1384-1387,1394

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