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夜视技术

防离子反馈Al_2O_3膜对三代夜视成像器件性能的影响

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摘要 为解决三代微光管寿命问题，采用电子显微镜和质谱仪对微通道板输入面溅射蒸镀的Al_2O_3膜质量进行了分析，研究了膜层对器件性能的影响，并就Al_2O_3给三代微光夜视成像器件带来的成像质量问题进行了讨论。研究结果表明：尽管Al_2O_3薄膜可以有效地防止离子反馈，但给管子成像质量带来了严重影响，使得图像模糊，信噪比降低等。提出了从本质上解决器件寿命问题的有效措施是将光电阴极与显示屏进行真空隔离，以实现光电阴极无离子反馈的轰击。

关键词 Al_2O_3膜 微光夜视成像器件 MCP 器件寿命
分类号 TN223

扩展功能
本文信息
Supporting info
PDF(200KB)
[HTML全文](0KB)
参考文献
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相关信息
本刊中 包含“Al_2O_3膜”的相关文章
本文作者相关文章
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Effect of ion feedback blocking Al_2O_3 film on the performance of third generation night-vision imaging device

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Abstract The quality of Al_2O_3 film evaporated on the input side of micro-channel plate is analyzed with electron microscope and mass spectrometer, and the influence of the film on the device performance is investigated to solve the problem of lifetime of 3rd generation low-light-level (LLL) tube. The effect of Al_2O_3 film on the imaging quality of 3rd generation LLL imaging devices is discussed. The research result shows that Al_2O_3 film affects the imaging quality of the LLL tube seriously, makes images dim and reduces the noise-to-signal ratio though it can effectively prevent the ion feedback. Another effective measure for solving the problem of device lifetime essentially is proposed, in which the vacuum isolation is implemented between photoelectric cathode and display screen to avoid the bombardment of ion feedback to the photoelectric cathode.

Key words Al_2O_3 film LLL night-vision imaging device microchannel plate device lifetime

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