

光学设计

基于水下反恐的微光成像系统

朱彩霞^{1,2}, 闫亚东^{1,2}, 沈满德^{1,2}, 何俊华¹

1. 中国科学院西安光学精密机械研究所, 陕西 西安 710119; 2. 中国科学院研究生院, 北京 100039

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摘要 介绍了一种水下反恐微光成像系统, 并对其中的关键技术作了论述。根据海水的光学特性及微光成像环境, 设计了具有针对性的水下专用镜头, 彻底校正像差并消除了水介质的影响。采用大型力学分析软件ANSYS对系统水密舱进行了有限元分析, 使系统的结构设计简单可靠。系统成功通过2006年青岛帆船赛的预演测试。试验证明: 在300m的水压下系统稳定可靠, 成像质量较高, 能对危险物进行及时预警, 达到水下反恐的目的。

关键词 [水下反恐](#) [水下微光成像](#) [水密舱](#) [水下镜头](#)

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Low-light-level imaging system for underwater anti-terrorism

ZHU Cai-xia^{1,2}, YAN Ya-dong^{1,2}, SHEN Man-de^{1,2}, HE Jun-hua¹

1. Xi'an Institute of Optics and Precision Mechanics, CAS, Xi'an 710119, China; 2. Graduate School of the Chinese Academy of Science, Beijing 100039, China

Abstract An underwater low-light-level imaging system for anti-terrorism operation is introduced, and its key techniques are addressed. According to the optical characteristics of ocean water and low-light-level imaging environment, a dedicated underwater lens was designed, which can correct the aberration and overcome the influence of water medium. The finite element analysis was made for the sealed cabin of its detectors to ensure its reliability and make the mechanic design simple. The system was successfully demonstrated in Qingdao sailing boat game. The test results show that the system works reliably under the water pressure of 300 meters, its imaging quality is high and it can provide time critical warning for dangerous item.

Key words [underwater anti-terrorism](#) [underwater low-light-level imaging](#) [waterproof cabin](#) [underwater lens](#)

DOI:

通讯作者 朱彩霞 zhucx@opt.ac.cn

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