

## 激光与光电子技术应用

### 水体后向散射光能量变化规律的仿真与实验

葛卫龙<sup>1</sup>, 华良洪<sup>2</sup>, 张晓晖<sup>1</sup>

1. 海军工程大学 兵器工程系, 武汉 430033;
2. 海军装备部, 北京 100841

**摘要:** 为了研究距离选通水下成像系统在采用等步长搜索策略进行目标搜索过程中增强型电荷耦合器件(ICCD)接收水体后向散射光能量的变化规律,建立了ICCD接收水体后向散射光能量计算模型,推导了单次成像时ICCD接收水体后向散射光能量的计算公式,对选通成像系统在搜索目标过程中,ICCD接收到水体后向散射光能量的变化规律进行了仿真计算和实验验证,利用ICCD显示图像的平均灰度和ICCD接收到水体后向散射光能量的对应关系,实验中得到了水体后向散射光能量变化规律的数据。结果表明,ICCD接收到的水体后向散射光能量随着距离增大近似呈指数下降。

**关键词:** 成像系统 距离选通 水体后向散射光 变化规律

### Simulation and experiment of change rule of water backscattering light energy

GE Wei-long<sup>1</sup>, HUA Liang-hong<sup>2</sup>, ZHANG Xiao-hui<sup>1</sup>

1. Department of Weaponry Engineering, Naval University of Engineering, Wuhan 430033, China;
2. Navy Equipment Department, Beijing 100841, China

**Abstract:** In order to study the change rule of water backscattering light energy received by a intensified charge-coupled detector(ICCD) in the process of searching for underwater targets by the equal step length, a model of water backscattering light energy received by the ICCD was built, and the formula of water backscattering light power received by the ICCD was deduced in a single imaging. Simulation computation and experiment validation were carried through. According to dependence of mean grayscale of the image on the water backscattering light energy, the data of the change rule of water backscattering light energy was obtained. The result shows that water backscattering light energy descends along with the distance of water accretion in exponent rule approximately.

**Keywords:** image system range-gated water backscattering light change rule

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通讯作者:

作者简介: 葛卫龙(1979-),男,讲师,博士,主要从事水下激光成像及图像处理技术等方面的研究。E-mail: dragon7209@163.com  
作者Email:

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