

## 传感器与信号处理

### 低信噪比条件下多基阵检测融合系统建模与性能分析

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摘要:

针对水下目标探测中的分布式检测融合问题,提出了一种低信噪比条件下的多基阵检测融合系统模型。基于水声信道估计和似然比检测原理,研究并比较了NP(Neyman-Pearson)准则下局部基阵判决采用二相相移键控(binary phase shift keying, BPSK)和二进制启闭键控(on-off keying, OOK)两种调制方式时的检测融合性能。理论分析和仿真实验表明:在低信噪比条件下,与单基阵探测系统相比,利用本文提出的多基阵检测融合模型建立探测系统能够有效提高对未知目标的检测概率,模型的提出对于水下分布式目标探测系统的建立具有较高的理论参考价值。

关键词: 检测融合 低信噪比 似然比检测 NP准则

### System modeling and performance analysis for detection fusion of multiple arrays under low SNR

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Abstract:

For solving the distributed detection fusion problem of underwater target detection, when the acoustic channel signal-to-noise ratio (SNR) is low, a new system model for the multi-array detection fusion system is proposed. Based on the estimation of acoustic channel and the principle of likelihood ratio test, the performance of detection fusion is studied and compared based on the principle of NP when the binary phase shift keying (BPSK) and on-off keying (OOK) modes are used by the local arrays. Both the theory analysis and simulation indicate that under low SNR condition, the probing system established by the proposed model could improve the detection performance effectively, the proposed model has high theoretical reference value to the establishment of the underwater target detection system.

Keywords: detection fusion low signal-to-noise (SNR) likelihood ratio test (LRT) Neyman-Pearson (NP) principle

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