

研究简报

主动声纳的混沌波形设计和解调方法

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摘要

该文为解决主动声纳隐蔽性差的问题, 提出了一种新的波形设计方法: 将特定编码调制到混沌信号中, 作为主动声纳的发射信号。文中全面考虑了水声信道滤波和加性噪声对回波的影响, 采用自适应滤波器解调回波, 通过识别编码检测回波信号。提出了改进的相平面Lyapunov自适应滤波器作为解调算法。仿真结果表明: 该解调算法在加性白噪声和滤波情况均有较好的解调效果, 并能满足实时性的要求。与现有的主动声纳发射信号相比, 提高了主动声纳的隐蔽性。

关键词 [主动声纳](#) [调制](#) [混沌](#) [滤波](#)

分类号 [U666.7](#)

Design of Chaotic Waveforms and Demodulator for Application to Active Sonar System

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Abstract

In this paper a new kind of waveform is proposed to improve covertness of active sonar. A specified code is used to modulate the chaotic signal as waveform of active sonar. The issues of the distortions introduced by filtered by physical underwater channel and additive noise are discussed. Echoes are demodulated by adaptive filter. Recovered signals are identified by stored specified codes. The Lyapunov adaptive filter improved in phase space is applied to be demodulator. The obtained results indicate that proposed demodulator quickly and accurately recover original chaotic signal distorted by additive noise and filter. It is found that chaotic waveforms are better covertness than the classical waveforms of active sonar.

Key words [Active sonar](#) [Modulate](#) [Chaos](#) [Filter](#)

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