[打印本页]　[关闭]

软件、算法与仿真

基于STFT的水声双扩展畸变信道检测算法

周晓萌, 侯朝焕, 鄢锦, 陈鹏

中国科学院声学研究所, 北京, 100190

摘要： 针对主动声纳中时延扩展和多普勒扩展同时存在的双扩展畸变信道,提出了一种基于短时傅里叶变换(short-time Fourier transform,STFT)的时频副本相关器(time-frequency replica correlator,TFRC).分析表明,时延扩展信道及多普勒扩展信道的最佳似然比检测器副本相关积分器(replica correlator integration,RCI)和分段副本相关器(segmented replica correlator,SRC)都是TFRC的特殊情况.数值仿真验证了TFRC的有效性,这种时-频处理方法为畸变信道稳健检测器的设计提供了一种新的思路.

关键词： 双扩展畸变信道　短时傅里叶变换　似然比检测器　时频副本相关器

Approach to signal detection in doubly-spread channels based on STFT

ZHOU Xiao-meng, HOU Chao-huan, YAN Jin, CHEN Peng

Inst. of Acoustics, Chinese Academy of Sciences, Beijing 100190, China

Abstract: In doubly-spread acoustic underwater channels,the received signal is dispersed in both time and frequency,which makes signal detection particularly challenging.The existing receiver performance is signaificantly degraded.A time-frequency framework is introduced,the proposed time-frequency replica correlator(TFRC) based on short-time Fourier transform(STFT) generalizes existing receivers and considers that both the segmented replica correlator(SRC) and the replica correlation integration(RCI) are the special cases of the TFRC.Computer simulations are carried out to show the efficiency of the TFRC,and a promising substantial improvement in performance is obtained compared with existing receivers over doubly-spread channels.

Keywords: doubly-spread acoustic underwater channels　short-time Fourier transform　likelihood ratio test　time-frequency replica correlator

通讯作者：

作者简介: 周晓萌(1982-),女,博士研究生,主要研究方向为阵列信号处理、水下声信号检测.E-mail:mengzhou2006@163.com
作者Email：

扩展功能

本文信息
- Supporting info
- PDF(3607KB)
- [HTML全文]
- 参考文献[PDF]
- 参考文献

服务与反馈
- 把本文推荐给朋友
- 加入我的书架
- 加入引用管理器
- 引用本文
- Email Alert
- 文章反馈
- 浏览反馈信息

本文关键词相关文章
- 双扩展畸变信道
- 短时傅里叶变换
- 似然比检测器
- 时频副本相关器

本文作者相关文章
- 周晓萌
- 侯朝焕
- 鄢锦
- 陈鹏

PubMed
- Article by ZHOU Xiao-meng
- Article by HOU Chao-huan
- Article by YAN Jin
- Article by CHEN Peng

参考文献：

[1] Van Trees H L.Detection,estimation and roodulation theory Part 3:radar and sonar signal processing [M].New York:Wiley,1971.

[2] Baggenstoss P M.On detection linear frequency-modulated waveforms in frequency-and time-dispersive channels:alternatives to segmented replica correlation[J].IEEE Journal Trans.on Oceanic Engineering,1994,19(4):591-598.

[3] Friedlander B,Zeira A.Detection of broadband signals in frequency and time dispersive channels [J].IEEE Trans.on Signal Processing,1996,44(7):1613-1622.

[4] Sayeed A M.Canonical time-fequency processing for broadband signaling over dispersive channels [C]//IEEE International Symposium on Signal Processing,1998:369-372.

[5] Sayeed A M,Aazhang B.Joint multipath-Doppler diversity in mobile wireless communications[J].IEEE Trans.on Communications,1999,47(1):123-132.

[6] 朱埜.主动声纳检测信息原理[M].北京:海洋出版社,1990.

本刊中的类似文章

1．王旭东，宋茂忠.基于STFT的宽带数字ESM接收技术[J]. 系统工程与电子技术, 2010,32(9): 1811-1814

2．卢中昊， 刘培国， 刘继斌.基于自适应抗干扰技术的辐射发射现场测量方法[J]. 系统工程与电子技术, 2012,34(2): 243-248

3．胡亚, 吴嗣亮.复杂信号环境下非合作突发通信信号的实时检测[J]. 系统工程与电子技术, 2012,34(7): 1463-1468