

论文

基于可变带宽EFT滤波器的带宽匹配数字接收方法

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摘要

该文提出了一种新的基于可变带宽EFT滤波器的带宽匹配数字接收方法。文中利用线性准时不变(LQTI)系统在扩展傅里叶变换(EFT)域的可变带宽频率特性来构建可变带宽滤波器(VBF),并将可变带宽EFT滤波器引入数字下变频(DDC),实现对不同带宽信号的匹配接收。应用这种滤波器的优点在于只有一个直接决定带宽的可调谐参数,更新机制简单。文中还进一步给出带宽匹配接收数字下变频的多相高效结构,运算效率和工程可实现性大大提高。实验结果证明了该方法的正确性和有效性。

关键词 [扩展傅里叶变换](#); [线性准时不变系统](#); [可变带宽滤波器](#); [带宽匹配接收](#); [多相结构](#)

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Bandwidth-Matched Digital Receiving Method Based on Variable-Bandwidth EFT Filter

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Abstract

This paper proposes a novel bandwidth-matched digital receiving method based on the variable-bandwidth EFT filter. The variable-bandwidth frequency characteristics of the Linear Quasi-Time-Invariant (LQTI) system in Extended Fourier Transform (EFT) frequency domain are used for constructing the Variable-Bandwidth Filter (VBF). By using the variable-bandwidth EFT filter, the Digital DownConversion (DDC) can correctly receive the signals with different bandwidth. Based on a simple updating routine, the proposed variable-bandwidth filter can considerably reduce the complexity during normal operations. It is proposed that the efficient polyphase structure of bandwidth-matched digital downconversion and a significant improvement in efficiency and realizability can be achieved. Finally, the experimental results show the correctness and validity of the method.

Key words [Extended Fourier Transform \(EFT\)](#) [Linear Quasi-Time-Invariant \(LQTI\) system](#) [Variable-Bandwidth Filter \(VBF\)](#) [Bandwidth-matched digital receiving](#) [Polyphase structure](#)

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