

论文

基于广义Gabor变换的最优LOFDM系统的脉冲成形

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摘要

LOFDM(Lattice Orthogonal Frequency Division Multiplexing)是时频弥散信道上的一种高速数据传输技术。但当LOFDM系统的脉冲成形滤波器不具有最优的时频局域化特性时,必将引入严重的ISI和/或ICI。因此脉冲成形滤波器的设计是最优LOFDM系统设计的重要组成部分。Strohmer和Beav(2001, 2003)给出了一种LOFDM脉冲成形滤波器的设计方法,但是计算量较大。为此,该文提出了一种广义Gabor变换,通过构造广义紧致Gabor原子来完成最佳LOFDM脉冲成形滤波器的设计的数值实现。理论分析和仿真试验都证明该方法比Strohmer和Beaver给出的方法更简单有效。

关键词 [LOFDM](#) [时频局域化特性](#) [脉冲成形](#) [广义Gabor变换](#) [广义Gabor基本矩阵](#) [广义紧致Gabor原子](#)

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Pulse-Shaping Based on Generalized Gabor Transform for Optimal LOFDM System

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Abstract

Lattice Orthogonal Frequency Division Multiplexing(LOFDM) is a promising technique for high data-rate transmission in double(namely time-frequency) dispersive channel. But, as pulse shaping filters of LOFDM system is badly-localized, it is certainty that ISI and/or ICI be introduced. Therefore, design of pulse shaping filters is an important task for design of optimal LOFDM system. Currently, Strohmer and Beaver(2001, 2003) present an approach to design of pulse shaping filters for optimal LOFDM systems, but, it is computatively complex. In this paper, a generalized Gabor transform is proposed. Utilizing an approach of attained generalized tight Gabor atoms, the time-frequency well-localized pulse shaping filters can be designed for optimal LOFDM system. It is showed through theory analysis and simulative experiment that this method is more efficient and simpler than that of Strohmer and Beaver(2001, 2003).

Key words [LOFDM](#) [Time-Frequency Localization\(TFL\)](#) [Pulse shaping](#) [Generalized Gabor transform](#) [Generalized Gabor basic matrix](#) [Generalized tight Gabor atoms](#)

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