论文

基于FRM结构的FIR滤波器的采样率变换方法

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摘要
该文在分析滤波器传递函数的对称性与其冲激响应的关系的基础上，提出了一类具有稀疏冲激响应系数的特殊滤波器，以这类滤波器作为原型滤波器可以进一步降低FRM结构FIR滤波器的计算复杂度。并研究了基于此类FRM结构FIR滤波器的采样率变换算法、实现结构、计算复杂度及其设计问题等。最后，通过实际例子验证这种采样率变换方法的有效性。

关键词　软件无线电　采样率变换　频率响应屏蔽（FRM）技术　半带滤波器

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A sampling rate alteration method based on FIR filter with FRM structure

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Abstract

In this paper, based on analyzing the relationship between the symmetry of a filter's transfer function and its impulse response sequence, a class of filter with sparse impulse response coefficients is presented. Using this class of filter as the prototype filter, the computational complexity of a FIR filter realized with FRM technique is further reduced. Then, the sampling rate alteration method based on FIR filter with FR.M structure, its architecture, computational complexity and the problem in designing are studied. Finally, this sampling rate alteration method is proved to be efficiency with examples.

Key words　Software radio　Sampling rate alteration　Frequency Response Masking（FRM）technique　Half-band filters

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