

广义Mobius变换和算术Fourier变换

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摘要 离散Fourier变换(DFT)在数字信号处理等许多领域中占有重要地位.近年来,出现一种优于FFT的算术Fourier变换来计算DFT.在广义Mobius变换的基础上,本文采用了一种改进的AFT来计算DFT,这种方法可以直接提取DFT的系数,且用数论的方法阐明了这一过程,并展开了进一步的讨论.这也代表了数论方法应用在计算数学领域的一个新的发展方向.

关键词 [广义Mobius变换](#) [算术Fourier变换](#) [离散Fourier变换](#)

分类号

GENERALIZED MOBIUS TRANSFORM AND ARITHMETIC FOURIER TRANSFORM

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Abstract The Discrete Fourier Transform (DFT) plays an important role in digital signal processing and many other fields. Recently a method called the Arithmetic Fourier Transform (AFT) that is better than FFT is used to compute DFT. In this paper, an improved AFT based on generalized Mobius inverse formula is used to compute DFT. This new method can extract directly the Fourier coefficients of DFT. We develop this process with the number theory method and extend the further discussion. This also leads to a new direction that number theory method is applied into computation mathematics.

Key words [Generalized Mobius transform](#) [arithmetic fourier transform](#) [discrete fourier transform](#)

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