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### 经验模态分解端点效应抑制的常用方法比较研究

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A comparison of the commonly used methods for the end effect restraint of empirical mode decomposition algorithm

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全文: PDF (3504 KB) HTML (1 KB) 输出: BibTeX | EndNote (RIS) 背景资料

**摘要** 由美国国家航空航天局(NASA)的Huang等提出的经验模态分解(Empirical mode decomposition, EMD)是一种先进的信号分析方法,能够有效地获得非平稳信号的时频特征,应用范围极其广泛.但是其利用样条曲线构造信号上下包络线的过程中存在严重的端点效应.针对这个问题,人们提出了各种抑制方法,并都取得了一定程度的效果,然而对各种方法的性能特点缺乏系统准确的评价.针对常用的几种方法:匹配延拓法、镜像闭合延拓法、极值点对称延拓法、多项式拟合延拓法等,通过估计各自的Hilbert谱,平均频率曲线的均方误差,以及计算复杂度等比较研究了各种方法的性能.

**关键词:** 希尔伯特-黄变换 经验模态分解 端点效应抑制

**Abstract:** The Empirical Mode Decomposition (EMD) developed by Huang etc. of the NASA is an advanced method for signal analysis, and its application scope is extremely widespread. It can effectively obtain the time-frequency characteristics of non-stationary signals. But there is an involved end issue in the course of getting two envelopes of the data using spline interpolation. Several approaches for restraining the end effect were proposed, and all have a certain degree of restraint effect. However, it is a lack of a systemic and accurate evaluation for the performance of these approaches. In this paper, several commonly used restraining methods, which include Matching Extending, Mirror Extending, Symmetrical Extending, and Polynomial Fitting. These methods have been evaluated by a comparison of the respective Hilbert spectrum, mean error of the estimated average frequency curve and computation load.

**Key words:**

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