

算法研究

离散频谱的加权相位差校正方法

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摘要:

该文首先研究了一般相位差法频率校正量的误差分布规律, 发现其误差均方差在整个频率间隔内并非均匀分布, 而是在中部有较大误差峰值. 针对这一现象提出了离散频谱的加权相位差校正方法, 并进行了仿真研究. 该方法在远离谱线的位置, 不仅考虑峰值谱线的作用, 还以一定的比例参考次峰值谱线的影响, 从而可在远离谱线的频点上有效地平抑一般相位差法的误差分布峰值, 从而进一步提高了相位差校正法的频率校正精度和算法的抗噪声能力. 另外, 讨论了该方法适用的区域为1/2频率间隔附近, 可通过校正门限G的选择来限定, 以提高校正精度.

关键词: 频谱校正; 相位差; 误差分布; 校正门限

Weighting Phase Difference Correcting Methods on Discrete Spectrum

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Abstract:

In this paper, the error distribution of the frequency correcting value by the general phase difference correcting methods is studied. It is discovered that the frequency error is not even in the whole frequency interval and the frequency error near the 1/2 frequency interval is bigger than others. There is a peak on the frequency error curve near the 1/2 frequency interval. To solve this problem, then the weighting phase difference correcting methods on discrete spectrum is proposed and simulated. Since not only the main peak spectrum line but also the second peak spectrum line is considered in some radio. In this method, the frequency errors figured out by the main peak spectrum line and the second peak spectrum line are weighted average by the amplitude ratio of the two spectrum lines. Then the amplitude error and the phase error can be figured out by the frequency error and the windows function. The new methods can effectively stabilize the peak in the error distribution of the general phase difference correcting methods appeared far away the spectrum line. Thus the new methods further improved the accuracy of the correcting frequency and the noise immunity of the algorithm. In addition, the applicable region of the methods is discussed, which is the region near the 1/2 frequency interval. Through the correcting threshold the applicable region can be restricted, in order to improve correcting accuracy.

Keywords: Spectrum correcting Phase Difference Error Distribution Correcting Threshold

收稿日期 2011-08-19 修回日期 2011-11-02 网络版发布日期 2012-01-25

DOI:

基金项目:

河北省高等学校自然科学研究计划项目(Z2010252); 河北省教育厅自然科学基金项目(2011116); 河北科技大学校立 基金项目(XL201164)

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