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基于稀疏重构的跳频信号时频分析方法

Time-frequency analysis of frequency-hopping signals based on sparse recovery

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中文关键词: [跳频信号](#) [稀疏重构](#) [时频分析](#) [近似 \$l_0\$ 范数](#)

英文关键词: [frequency-hopping signals](#) [sparse recovery](#) [time-frequency analysis](#) [approximate \$l_0\$ norm](#)

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中文摘要:

针对现有时频分析方法存在噪声抑制能力弱、时频聚集性不强的缺点,提出了一种基于稀疏重构的跳频信号时频分析方法来获取清晰的、高聚集度的时频图。首先根据惩罚函数的思想建立了跳频信号无约束的稀疏重构模型;然后理论分析了惩罚函数因子的取值标准;最后用近似 l_0 范数算法求解得出跳频信号的时频图。仿真结果表明该算法能够有效地获取跳频信号的时频图。

英文摘要:

To overcome the common shortcomings shared by the existing methods: weak suppression noise interference and feeble performance of time-frequency concentration, a novel time-frequency analysis method based on sparse representation was developed, which could get clear and concentrate time-frequency representation. Firstly, the unconstrained sparse representation model of FH signals was established according to the punish function theory. Then, the guideline of punish parameters were analysed theoretically and got time-frequency representation by solving the optimization problem used approximate l_0 norm finally. The simulation results show that this method is capable of getting clear time-frequency pattern.

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