

一种基于峰均功率比的信源个数检测新方法

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A New Method for Source Number Detection Based on Peak-to-average Power Ratio

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摘要

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摘要 该文将特征向量信息与假设检验法相结合,提出了一种基于峰均功率比门限(Peak-to-Average Power Ratio Threshold, PAPRT)的信源个数检测新方法。该方法利用特征向量对接收数据进行加权,然后计算其峰均功率比,利用峰均功率比值与特征值在区分信号和噪声方面的一致性,通过引入一个二元假设检验过程,检测信号源个数。仿真结果表明,PAPRT方法在低信噪比下,对等强双目标的检测性能优于特征值门限(Eigen Threshold, ET)方法,且不受目标强度差的影响,对不等强多目标也具有优良的检测性能。

关键词: 多目标检测 特征向量 峰均功率比 不等强多目标

Abstract: In this paper, a new method based on Peak-to-Average Power Ratio Threshold (PAPRT) is proposed by combining the eigenvectors with the binary hypothesis testing. The eigenvectors are employed to weigh the received data and then the peak-to-average power ratio is calculated. According to the fact that both the eigenvalues and the peak-to-average power ratio have valuable information in distinguishing signal from noise, the source number is detected by introducing the binary hypothesis testing process. Simulation results show that PAPRT method is superior to the Eigen Threshold (ET) method under lower SNR when two sources are of equal intensity. And it also has a good performance when the sources are of unequal intensity, with no influence by the intensity difference between the targets.

Keywords: Multi-target detection Eigenvector Peak-to-average power ratio Different intensity targets

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