

算法研究

基于PN码的数据辅助前向位定时估计

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摘要:

突发信号一般采用前向结构的位定时估计。针对非数据辅助的前向位定时估计算法在低信噪比和小成形系数场合性能严重恶化的情形, 本文提出了一种适用于PN码的数据辅助前向位定时估计算法。该算法利用突发信号帧头捕获过程中的相关值, 通过插值运算估计出精确的位定时信息, 仅需每符号2个样点的采样, 实现简单, 估计性能优良。即使在低信噪比和小成形系数场合, 估计方差仍然非常逼近修正克拉美罗界(MCRB)。最后针对两种应用场合给出了算法的实现结构。

关键词: 突发; 位定时估计; 前向估计; 数据辅助

Feedforward Data-Aided Timing Estimation for PN code

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Abstract:

Feedforward symbol timing estimating algorithm is usually used for burst signal. Performance of non-data aided algorithm is seriously deteriorated when signal is shaped with small rolloff parameter or at low signal-noise ratio environment. A new feedforward data-aided timing estimation algorithm is proposed in this paper to solve this problem. Accurate timing estimation is made here by interpolation to the correlations which has been calculated at acquisition process already. The algorithm requires only two sampling points per symbol and can be realized much simple. But simulations suggest it results in perfect performance. MSE of it closely approaches the modified Cramer-Rao bound (MCRB) even at very low signal-noise ratio or with little rolloff parameter. Structures of the algorithm are also provided here for two different types of applications.

Keywords: burst timing estimation feedforward estimation; data- aided

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