

防御电子技术

卫星DSSS通信系统杂乱脉冲干扰抑制技术研究

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摘要:

针对杂乱脉冲干扰卫星直序扩频(direct sequence spread spectrum, DSSS)通信系统的问题, 首先提出了一种改进自回归(autoregressive, AR)二阶重极点干扰模型。并基于该模型提出了利用有限脉冲响应(finite impulse response, FIR)双边抽头维纳插值滤波器抑制杂乱脉冲干扰的方法, 推导了改进AR二阶重极点干扰模型自相关函数表达式。分析并仿真了在该模型下卫星DSSS通信系统抑制杂乱脉冲干扰时同步互相关峰值的改善。仿真结果表明, 基于该模型的FIR线性插值维纳滤波器能有效地抑制杂乱脉冲对卫星DSSS通信系统的干扰。与传统AR模型相比, 该模型在多载频和实极点两个方面有更好的工程应用价值。

关键词: 杂乱脉冲 卫星DSSS通信系统 改进AR干扰模型 维纳滤波器

Research on disordered pulse interference suppression technologies in satellite DSSS communication systems

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Abstract:

Aiming at the problem that the disordered pulse interference in the satellite direct sequence spread spectrum (DSSS) communication system, a finite impulse response (FIR) linear transversal interpolation filter based on the improved second order multiple poles interference model is proposed. This article gives the detailed auto correlation function expression of the model. On the basis of the model, the change of DSSS communication system cross correlation values with the interference of disordered pulses is analyzed. Both of analysis results and numerical simulation results show that the FIR linear transversal interpolation filter based on the improved second order multiple poles interference model can suppress the disordered pulse effectively. Compared with the traditional AR model, the improved model has good engineering application in two aspects of multiple carriers and real poles.

Keywords: disordered pulse satellite DSSS communication system improved AR interference model Wiener filter

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