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脉冲干扰下交错与FEC编码扩频系统性能的研究

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PERFORMANCE OF COMBINED CODING AND INTERLEAVING SPREAD SPECTRUM SYSTEM IN THE PRESENCE OF ON-OFF JAMMING

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摘要 推导了在脉冲干扰下无人机扩频遥测系统的误码率公式。提出了用吉尔伯特信道（Gi信道）描述脉冲干扰下无交错编码的扩频系统的信道,用离散无记忆信道（DMC)描述脉冲干扰下的有交错扩频系统的信道。对比分析了脉冲干扰下的扩频系统采用 FEC前向纠错和不采用 FEC,以及采用 FEC与交错技术相结合3种情况时的系统误码率性能。最后通过数值计算分析,得到了一些有用的结论。所得公式和结论同样适用于部分频带干扰

关键词： 扩频 脉冲干扰 前向纠错(FEC) 交错 误码率

Abstract： On off noise jamming is one of the most effective counterplots for spread spectrum (SS) systems. A common formula of the bit error rate of SS systems under on off jamming is given. In the presence of on off jamming, the coded SS telemetry system without interleaving can be described as a Gilbert channel model, while the coded SS telemetry system with interleaving as a DMC model. The performance of a combined coding and interleaving SS telemetry system is compared with that of a non coded and non interleaved system, as well as of a non interleaved but coded system. Analysis and numerical calculation results show that this combined coding and interleaving technology can greatly improve the performance of SS telemetry systems under on off jamming. Besides, these formulas and results also adapt to partial band jamming.

Keywords： spr ead spectrum   on-off jamming   err or cor rection coding   inter leaving   bit er ror r ate

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