

# CRC 交织级联编码在 QPSK 通信系统中的应用研究

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**摘要:** 主要研究循环冗余校验码 (CRC) 交织级联编码在正交相移键控 (QPSK) 通信系统的应用.首先完成了基于 MATLAB/Simulink 的 QPSK 通信系统的仿真设计, 然后在 QPSK 系统中采用 CRC 进行信道编码, 通过测试发现, 系统接收和发送的信号波形一致, 说明系统仿真设计合理有效.进一步将 CRC 编码和交织编码进行级联应用到 QPSK 系统.对比误码率数据发现, CRC 编码能够有效降低系统误码率、改善系统的性能, 编码增益能达到 3 dB, 级联编码较 CRC 编码性能有进一步提高.这给出了通信系统仿真设计的一种新方法, 为实验教学提供一种新思路.

**关键词:** CRC; 交织; QPSK; 误码率

## Research for Concatenation of CRC and Interleaver in QPSK Transmission System

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**Abstract:** We mainly make researches for CRC and interleaver in QPSK transmission system. We firstly design a QPSK transmission system based on MATLAB/Simulink platform, then CRC coding is applied in the QPSK transmission system. After debugging and testing, the received waveforms are consistent with the transmitted waveforms, which can indicate that the system design is effective. Further, we make concatenation CRC and Interleaver in QPSK system. According to data comparison, it can be concluded that CRC can decrease the symbol error rate and improve system reliability performance, up to 3 dB of the signal to noise ratio gain can be achieved. Concatenation coding can make a further performance improvement. This researches can give a new method for simulation design of communication system, and provides a new idea for experimental teaching.

**Key words:** CRC; interleaver; QPSK; symbol error rate

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