Wide-Band Channel Simulation for OFDM Wireless Systems

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ABSTRACT

This thesis utilizes Tapped delay line (TDL) to simulate the wireless wide-band channel, as well as the principle of Rice process generated by a finite sum of weighted sinusoids and Monte Carlo law to simulate the statistics characteristic. This thesis also compares two kinds of methods. According to the statistics characteristic the signal appears Rayleigh Distribution and Rician Distribution, the result of simulation can know the signal has frequency selective fading, multipaths, probability density function (PDF) and the PDF accord with Rayleigh and Rician. According to the result of the principle of Rice process generated by a finite sum of weighted sinusoids, the measure of calculation is smaller, but the weakness is to have periods and the random isn’t enough. And the emulation of the Monte Carlo method has better performance to the random, which utilizes an approximate formula of the kind zero-order modified Bessel function [13], but the weakness is to measure of calculation is bigger, and K factor makes the I0 error margin bigger. This thesis simulate two kinds of channel fading for wireless wide-band channel and also have better performance which is easy to realize.

Keywords: wireless wide-band channel simulation; OFDM; Rician; Rayleigh; Monte Carlo

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