A Study of the Influence of Path Loss and Short Term Fading on the Performance of Mobile Radio System

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Abstract

The mobile radio channel places strong limitations on the performance of wireless communication systems because the transmission principle in wireless communication is more complex than those of the wired networks. In this paper we discuss the radio propagation with an objective to provide an overview of various characteristics of radio channel and an understanding of the process and factors that influences these characteristics. Section I describe a typical outdoor scenario for terrestrial mobile radio channel and principle causes of information loss (multipath fading). Section II presents the various radio channel characteristics like path loss which is used to denote the local average received signal power relative to the transmit power and helps in providing the information on coverage area. Other higher order statistical characteristics such as level crossing rate (lcr) and average duration of fade (adf), which relates the time rate of change of the received signal to the signal level and velocity of the mobile, are also considered to study the influence of short term fading on the performance of the wireless system. Section III contains the observed path loss and its comparison with the simulated path loss propagation models. Lcr and adf are obtained from the received signal envelop in section IV to study the system performance. The simulated results obtained in section III and section IV provide valuable information on coverage area, and choice of suitable data rate, word length, modulation, and coding schemes as stated in table1.
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References


Index Terms

Computer Science
Mobile Communication

Keywords

Channel characterization, path loss, fading effect, mobile cellular communication, and wireless system
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