Abstract

Adaptive modulation and coding (AMC) refers to the choice of modulation, coding and other
signal parameters according to the instantaneous conditions in the channel. This paper explains the potential of AMC in wireless communication over time-varying fading channel. By the use of rate adaptive transmission, the transmitted information rates are significantly increased provided accurate channel modelling and channel state estimation is done. An important performance measure discussed in this paper is spectral efficiency (Bits/sec/Hz). Also, since the channel states have to be estimated at the receiver, there would be a certain degradation of system performance compared to ideal case of perfect channel knowledge. The adaptive modulation provides various modulation scheme and modulation levels according to instantaneous channel conditions. When the received signal is not faded, the modulation mode having a higher data rate is selected to take advantages of good channel conditions and maximize throughput. When the received signal fades, the modulation level that decreases a data rate is selected. N-MSK modulation scheme is preferred in non-linear channel conditions and in communication systems where power sources are limited. N-QAM is used mostly in linear channels. OFDM modulation scheme is used for high data rate transmission over frequency selective fading channel. Good performance of these schemes requires accurate channel estimation at the receiver and a reliable and fast feedback path between estimator and the transmitter.

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