

Performance Study of the Downlink Physical Layer in LTE

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Abstract

The increased demand for high data-rate and low-latency of the new mobile applications such as Mobile TV or Multimedia Online Gaming has lead to the development and standardization of UTRA Long Term Evolution (LTE). The purpose of this paper is to evaluate the performance of the downlink PHY layer in terms of data rate and bit error probability under various mobile scenarios. In order to obtain the LTE peak data-rate in some given channel conditions, a single end user is considered who benefits from a full resource allocation. A comparison is made between coded and uncoded transmissions, being evaluated the performances of turbo coding schemes provided by the LTE standard specifications. Also two link adaptation algorithms are proposed with the purpose of improving the performance of the transmission. Finally, a theoretical study of the circular buffer rate-matching algorithm and of the Hybrid-ARQ protocol based on this algorithm is realized.