

Analytical Downlink Effective SINR Evaluation in LTE Networks

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Abstract : The aim of this work is to provide an original analytical framework for downlink effective SINR evaluation in LTE networks. The classical single carrier SINR performance evaluation is extended to multi-carrier systems operating over frequency selective channels. Extension is achieved by expressing the link outage probability in terms of the statistics of the effective SINR. For effective SINR computation, the exponential effective SINR mapping (EESM) method is used on this work. Closed-form expression for the link outage probability is achieved assuming a log skew normal approximation for single carrier case. Then we rely on the lognormal approximation to express the exponential effective SINR distribution as a function of the mean and standard deviation of the SINR of a generic subcarrier. Achieved formulas is easily computable and can be obtained for a user equipment (UE) located at any distance from its serving eNodeB. Simulations show that the proposed framework provides results with accuracy within 0.5 dB.

Keywords : LTE, OFDMA, effective SINR, log skew normal approximation

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