

Large Scale System Evaluations using PHY Abstraction for LTE with OpenAirInterface

Author(s) - Institution(s):

Imran Latif, Eurecom
Florian Kaltenberger, Eurecom
Navid Nikaein, Eurecom
Raymond Knopp, Eurecom

Corresponding author email: imran.latif@eurecom.fr

Corresponding WG group: TWGU, WG1

Abstract:

In wireless communications the evaluation of large scale systems with the help of system simulators is of utmost importance. However, these simulations have a high computational complexity due to the physical layer (PHY) algorithms and the channel model used. Many system level simulators therefore rely on PHY abstraction techniques that predict the performance of the PHY based on the current channel state. The OpenAirInterface (OAI) LTE system level simulator is one of the only tools that can be either run with a full PHY or with PHY abstraction. In this paper we present the complete methodology of expected effective SINR mapping (EESM) based PHY abstraction for OAI LTE system level simulator. We present the methodology for not only single-input single-output (SISO) communication but also for multiple-input multiple-output (MIMO) communication in LTE. We show with the help of results that implemented PHY abstraction improves the simulation time by a factor of 30 while providing the same accuracy as the full PHY implementation.