Massive MIMO Channel Modeling -- Extension of the COST 2100 Model

Author(s) - Institution(s):
Xiang Gao, Lund
Jose Flordelis, Lund
Ghassan Dahman, Lund
Fredrik Tufvesson, Lund
Ove Edfors, Lund

Corresponding author email: xiang.gao@eit.lth.se

Corresponding WG group:

Abstract:

As massive MIMO is currently considered a leading 5G technology candidate, channel models that capture important massive MIMO channel characteristics are urgently needed. In this paper we present an attempt for massive MIMO channel modeling based on measurement campaigns at 2.6 GHz in both outdoor and indoor environments, using physically-large arrays and with closely-spaced users. The COST 2100 MIMO channel model is adopted as a general framework. We discuss modeling approaches and scopes for massive MIMO, based on which we suggest extensions to the COST 2100 model. The extensions include 3D propagation, polarization, cluster behavior at the base station side for physically-large arrays, and multi-path component gain functions for closely-spaced users. Model parameters for these extensions in massive MIMO scenarios are reported. Initial validation against the measurements are also performed, which shows that the model is capable of reproducing the channel statistics in terms of temporal behavior of the user separability, singular value spread and sum-rate/capacity.