

EESM-log-SGN - Quick Start Guide

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This document describes the MATLAB implementation of EESM-log-SGN method, its low-storage complexity versions: EESM-log-SGN-LSC and EESM-log-SGN mixture model.

Prerequisites:

MATLAB

MATLAB WLAN toolbox

Folders and subfolders:

Folder and subfolders	Description
1 No interference	No interference in the PHY layer. EESM-log-SGN models effective SNR
1 No interference/1 SU simulation code	Simulate 20MHz/40MHz/80MHz/160MHz OFDM MIMO system
1 No interference/1 MU simulation code	Simulate 20MHz OFDM/OFDMA MIMO/MU-MIMO system
2 Interference	≥ 1 interferer in the PHY layer. EESM-log-SGN models effective SINR
1 full PHY	Symbol-level full PHY simulation adapted from MATLAB WLAN toolbox. The configuration is set in fullPHY.m in this folder. The output of the full PHY simulation is packet error state for each packet, and post-MIMO-processing SINR matrix. These output are automatically stored in a file.
2 EESM parameter optimization	Generate EESM parameter beta using the file outputted by the full PHY simulation.
2 RBIR parameter optimization	Generate RBIR parameters, alpha and beta, using the file outputted by the full PHY simulation.
2 traditional EESM abstraction	Using the EESM parameter beta, generate effective SINR. The principle follows IEEE evaluation methodology suggested by TGax group. The configuration is set in fullPHY.m in this folder. The configuration is set in eesmAbstraction.m in this folder.
2 traditional RBIR abstraction	Using the RBIR parameters, alpha and beta, generate effective SINR. The principle follows IEEE evaluation methodology suggested by TGax group. The configuration is set in fullPHY.m in this folder. The configuration is set in rbirAbstraction.m in this folder.

3 log-SGN method	Using the full PHY outputs and the EESM parameter beta, generate 4 log-SGN parameters. The simulation script is skewGeneralizedNormalApp.m.
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MATLAB simulation example files:

Simulation example files	Description
Matlab Simulation Example 1_PHY abstraction under 20MHz 11ax OFDM SISO system	This example shows the implementation flow for EESM-log-SGN under 20MHz 11ax OFDM SISO system.
Matlab Simulation Example 2_PHY abstraction under 40MHz 11ax OFDM SISO system	This example shows how to extend Example 1 into higher bandwidth cases.
Matlab Simulation Example 3_PHY abstraction under 11ax OFDM MIMO system	This example shows how to extend Example 2 into higher MIMO cases.
Matlab Simulation Example 4_PHY abstraction under 11ax OFDMA SISO system	This example shows the implementation guide for implementing EESM-log-SGN under 20MHz 11ax OFDMA SISO system.
Matlab Simulation Example 5- PHY abstraction under 11ax OFDM/OFDMA MIMO/MU-MIMO system	This example shows how to extend Example 5 into general OFDM/OFDMA MIMO/MU-MIMO cases with interference.
Matlab Simulation Example 6- EESM-log-SGN-LSC under 11ax OFDM/OFDMA MIMO/MU-MIMO system	This example shows how to extend Example 6 into EESM-log-SGN-LSC implementation.