

RP-161712
Motivation for new work item on performance requirements
for LTE advanced receiver with 4Rx
Huawei, HiSilicon

Motivation

- In Rel-12, SU-MIMO advanced receiver which is able to cancel the inter-stream interference was specified for 2Rx UE
 - Significant gain was observed for multi-layer MIMO operation without change of physical layer design
 - Advanced receiver is named as Type-C receiver, and corresponding demodulation performance requirements with TM3, TM4 and TM9 are specified.
- In Rel-13 the demodulation performance requirements specified for 4Rx UE are specified, but requirements are based on MMSE/MMSE-IRC.
- We propose to specify 4Rx SU-MIMO advanced receiver performance requirements to further enhance 4Rx SU-MIMO performance for rank >1
 - Advanced receiver including Reduced ML will be considered.
 - 4Rx SU-MIMO advanced receiver should be specified as a new feature since the specific design is needed.

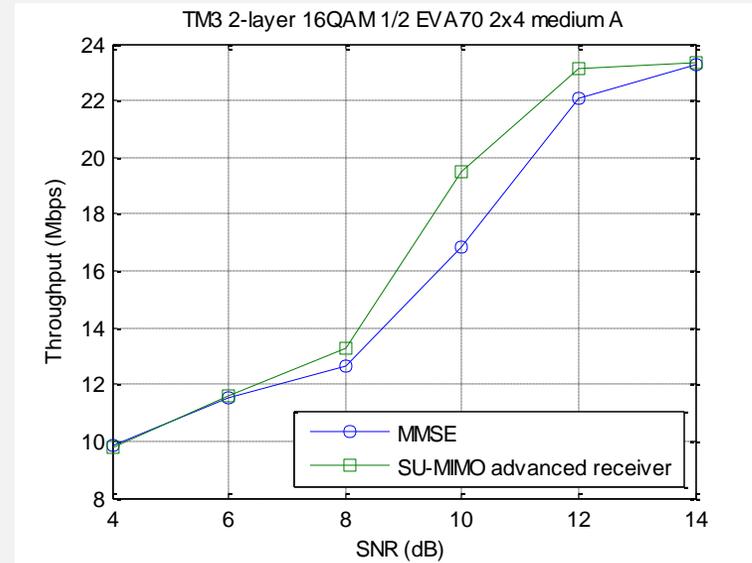
Motivation

- Evaluations
 - Assumptions

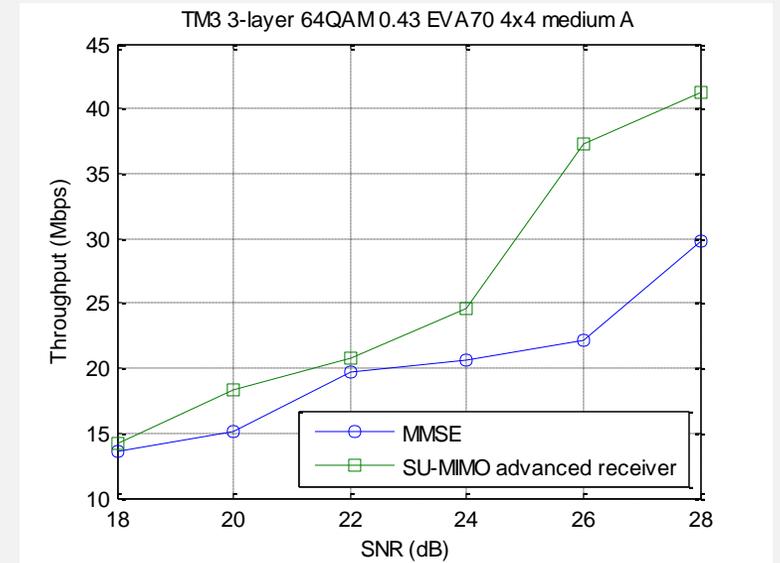
Cases	Descriptions
Case 1	TM3 2-layer 16QAM 1/2 EVA70 2x4 medium-A FDD
Case 2	TM3 3-layer 64QAM 0.43 EVA70 4x4 medium-A FDD
Case 3	TM3 2-layer 16QAM 1/2 EVA70 2x4 medium FDD
Case 4	TM4 2-layer 16QAM 1/2 EPA5 4x4 medium FDD
Case 5	TM9 2-layer 16QAM 1/2 ETU5 2x4 medium FDD

Motivation

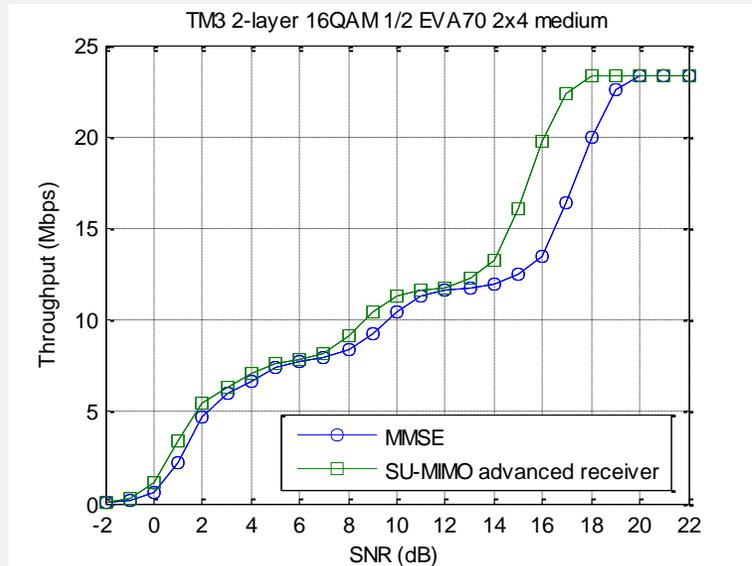
- Evaluations
 - Simulation results
 - Up to 3dB gain can be observed depending on test cases



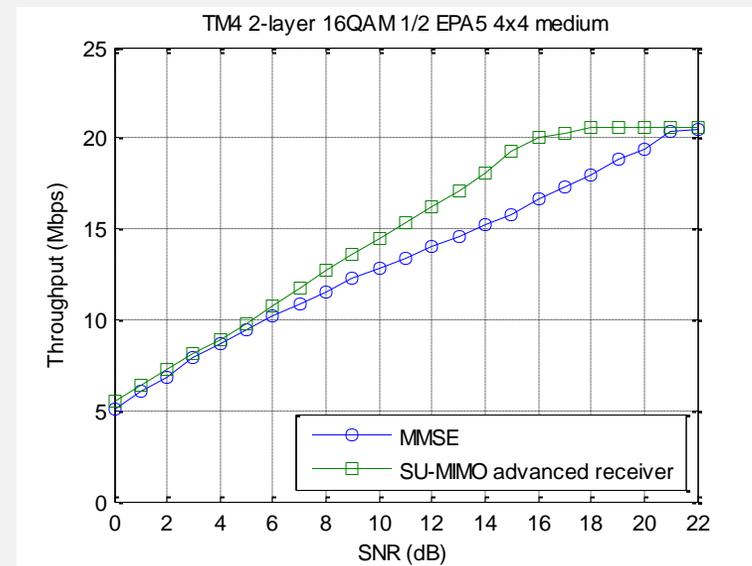
Case 1



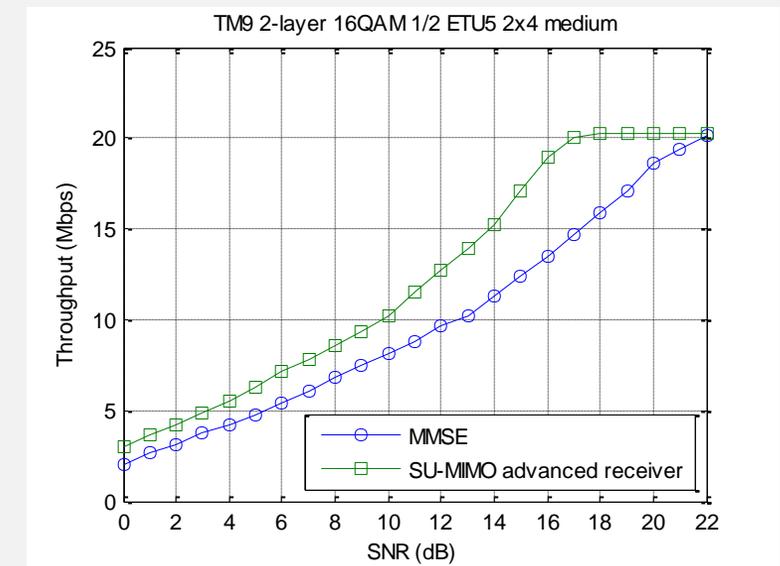
Case 2



Case 3



Case 4



Case 5

Objectives

- Stage 1: Investigate performance benefits and feasibility of using SU-MIMO IM for the scenarios with 4 Rx, including
 - SU-MIMO scenarios (including rank-1/2),
 - Rank to be supported,
 - Tx EVM,
 - Channel correlation
 - Modulation order
 - Identify the reference receiver structure (e.g., R-ML)
 - Evaluate the performance of enhanced SU-MIMO IM receivers.
- Stage 2: Specify demodulation performance requirements for SU-MIMO IM receivers with 4Rx based on agreed reference receiver and scenarios in Stage 1.
 - Single carrier case