



# Rel-15 WID proposal: Further enhancements to CoMP operation

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# Background

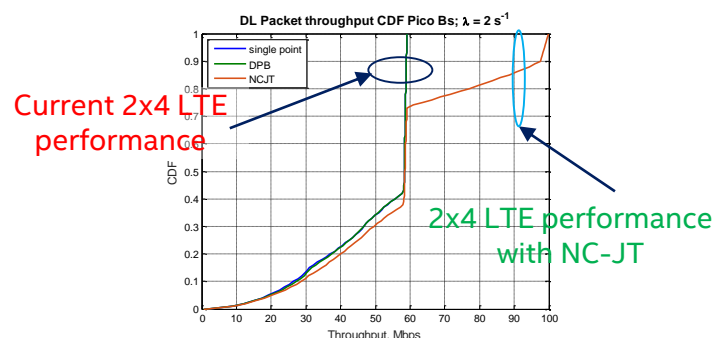
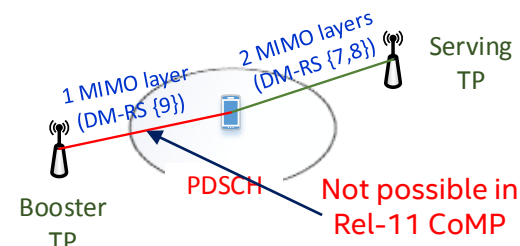
In the RAN#71 meeting study item “Further enhancements to Coordinated Multi-Point Operation (CoMP) for LTE” was approved

The main objectives of the study item is to identify and evaluate the performance benefits of the following enhancements:

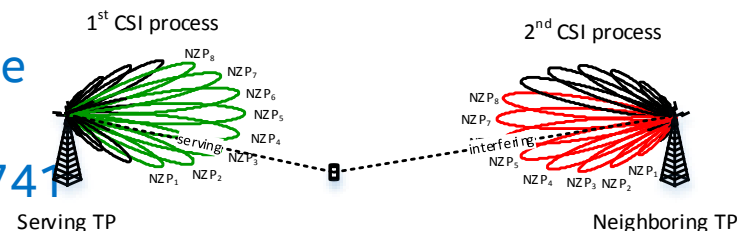
- Support of non-coherent joint transmission (JT) (e.g. support of MIMO layers transmission by the different transmission points in the single-user MIMO)
- Extension of beamforming and scheduling coordination (CS/CB) for Rel-13 FD-MIMO on the transmission points

In RAN1#88, RAN1 has successfully completed the Rel-14 FeCoMP study item with performance observations and conclusions captured in TR 36.741

## Non coherent JT



## CS/CB with FD-MIMO



# NC-JT performance observations from TR 36.741

From system-level simulation results NC-JT schemes provides the following performance improvement

- NC-JT provides 26.36% performance gain in average UPT
- NC-JT provides 37.26% performance gain in 95%-tile UPT
- NC-JT provides 24.33% performance gain in 50%-tile UPT
- NC-JT provides 12.66% performance gain in 5%-tile UPT
- Note: The above results for each metric are average over all simulation scenarios

The NC-JT gains depends on the RU and number of antenna at TPs

- In general, NC-JT gains increase when the RU values decrease
- NC-JT shows gains for different number of TRP and UE antenna ports

# CS/CB performance observations from TR 36.741

From system-level simulation results CS/CB FeCoMP with FD-MIMO provides the following performance improvement

- CS/CB provides 18% performance gain in average UPT
- CS/CB provides 6% performance gain in 95%-tile UPT
- CS/CB provides 46% performance gain in 50%-tile UPT
- CS/CB provides 61% performance gain in 5%-tile UPT
- Note: The above results for each metric are average over all simulation scenarios

Simulation results in Table 7.2-4 were obtained based on large number TRPs in coordination cluster

Substantially larger gain of CS/CB is observed with the largest coordination area

This observation is based on evaluation results including one set of results with coordination area of 57 cells.

The CS/CB gains depends on the RU

# Conclusions from Rel-14 FeCoMP SID

## NC-JT can increase system user experience

- NC-JT is generally more beneficial when the network experiences lower traffic load
- NC-JT is generally more beneficial in user perceived throughput for 50%-tile and 95%-tile of UE perceived throughput distribution, compared to other UEs
- NC-JT is generally beneficial for 4Rx UEs
- NOTE: Gain is also observed for 2Rx UEs in one set of results

## CS/CB with FD-MIMO can increase system user experience

- CS/CB is generally more beneficial when the network experiences higher traffic load
- CS/CB is generally more beneficial in user perceived throughput for 5%-tile (cell-edge performance) of UE perceived throughput distribution, compared to other UEs
- NOTE: Substantially larger gain of CS/CB is observed with the largest coordination area based on one set of results

RAN1 concludes this Study Item and is ready for Work Item

# Objectives of Rel-15 FeCoMP WID

Specify enhancements to support non-coherent joint transmission (JT) schemes [RAN1]

- Support of a new QCL assumption for DM-RS antenna ports
- Support of control signalling enhancements to assist QCL, PDSCH REs mapping and resource allocation
- Support possible CSI feedback enhancement

Specify enhancements to support coordinated scheduling and coordinated beamforming (CS/CB) for FD-MIMO in the following areas [RAN1]

- Support of overhead reduction scheme for channel and interference measurements for CSI
- Support of QCL enhancements on Class B FD-MIMO

Specify higher layer support of enhancements listed above [RAN2]

# Possible timelines for completion of the WID (RAN1)

