

# Systems level evaluations on CRS interference in scenarios with overlapping spectrum for LTE and NR

Source: AT&T

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Document for: Discussion

## Background

RAN4 #99e discussed CRS interference handling in Rel. 17 [1]

According to the agreed Way Forward [2], simulation results will be collected before RAN4 #100e

Link level simulation assumptions were agreed in [2]

This contribution presents additional systems level simulation results

[1] R4-2108696, Email discussion summary for [99-e][330] NR\_perf\_enh2\_Demod\_Part1, Moderator (China Telecom)

[2] R4-2108662, WF on CRS interference handling in scenarios with overlapping spectrum for LTE and NR, China Telecom

## Simulation Parameters

Parameter	Assumption
Carrier Frequency	1955 MHz
Carrier Channel Bandwidth	20 MHz
Number of carriers	1
Number of users per cell	5 UEs
SCS	15 kHz
Channel Model	NR UMa
Base station height	25m
UE height	1.5m
UE location	80% indoor
Layout	21 sectors with full wrap-around
ISD	1000m
BS Tx Power	52 dBm
BS Antenna gain	14 dBi
BS Noise Figure	5dB
UE receiver	MMSE-IRC
BS antenna Array configuration	$(M, N, P, M_g, N_g) = (1, 2, 2, 1, 1)$ , $d_H = d_V = 0.5 \lambda$
UE antenna Array configuration	$(M, N, P, M_g, N_g) = (1, 1, 2, 1, 1)$ , $d_H = d_V = 0.5 \lambda$
Traffic model	Bursty data - FTP Model 3
CSI feedback	Wideband
Scheduler	PF
Architecture	SA
MBSFN subframes	4 MBSFN subframes per 40ms for NR SSB, CSI-RS, TRS, RMSI, OSI
DSS mode	Dynamic DSS at TTI level
CRS	Interference and overhead is modeled
CRS power boost	0 dB

## Evaluation Assumptions

For the CRS-IC receiver, perfect channel estimation is assumed

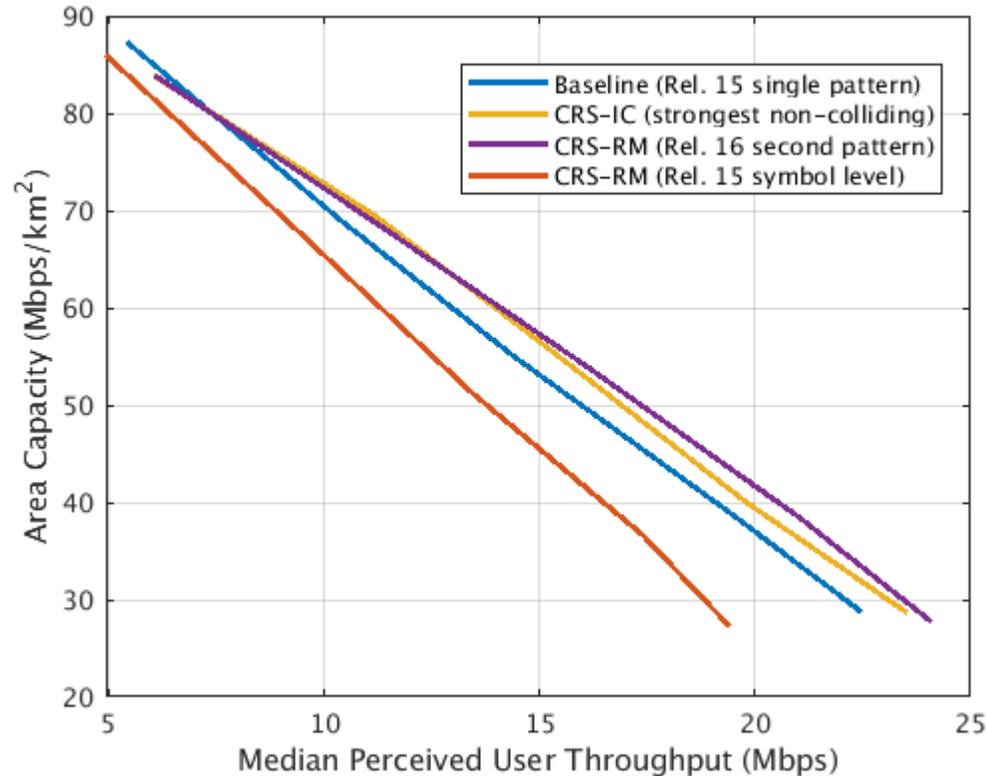
Following [3], CRS-IC is only turned on when the interfering cell's RSRP is within 6dB of the UE's serving cell RSRP

A UE cancels the CRS of the cell with the strongest RSRP whose CRS is not colliding with the serving cell's CRS

For the CRS-RM receiver, both Rel. 15 symbol level rate matching and Rel. 16 CRS rate matching (second pattern) are evaluated

[3] RP-210350, Discussion of LTE CRS-IC for DSS, Qualcomm

## Simulation Results



CRS-IC and Rel. 16 rate matching (second pattern) perform similarly especially at high load

Rel. 15 symbol level rate matching results in a significant performance loss



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