**3GPP TSG-RAN WG4 Meeting # 100-e R4-2115039**

**Electronic Meeting, August 16-27, 2021**

**Agenda item:** 9.16.6

**Source:** Moderator (CATT)

**Title:** Email discussion summary for [100-e][139] NR\_ext\_to\_71GHz\_Part\_3

**Document for:** Information

# Introduction

This email discussion is to discuss the co-existence simulation for extend to 71 GHz WI. The targets of the two rounds are as following,

* 1st round:
  + Summarize and collect comments on simulation assumption, calibration and future plans to have some tentative agreements.
* 2nd round: TBA
  + Agree the co-existence simulation WF.

# Topic #1: Simulation assumption

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2114693  (Rev R4-2111914) | CATT | The confirmation of the simulation assumption and the calibration between different companies are needed. |
| R4-2114694  (Rev R4-2112020) | Korea Testing Laboratory | **Proposal 1: Further study for coexistence in dynamic time-division duplex (D-TDD) systems is required in indoor scenarios.**  **Proposal 2: study of timing asynchronous scenario which can affect TP loss caused by ACIR for indoor scenarios.** |
| R4-2112997 | vivo | **Proposal 2: For UL coexistence study, the EIRP limit and power control parameters should be further studied.** |
| R4-2113316 | Ericsson | **Proposal 1:** It is proposed to use antenna model parameter sets in Table 2.1-2 if co-existence simulations are considered or if antenna parameters are shared to other groups.  **Table 2.1-2: Deployment scenarios**   |  |  |  |  |  | | --- | --- | --- | --- | --- | | **Parameter** | **Sub-urban** | **Urban** | **Dense urban** | **Indoor** | | *Am* (dB) | 30 | 30 | 30 | 30 | | *SLAv* (dB) | 30 | 30 | 30 | 30 | | *3dB* (deg.) | 90 | 90 | 90 | 90 | | *3dB* (deg.) | 90 | 90 | 90 | 90 | | *GE,max* (dBi) | 5.3 | 5.3 | 5.3 | 5.3 | | *LE* (dB) | 2.2 | 2.2 | 2.2 | 2.2 | | *M* | 32 | 16 | 8 | 4 | | *N* | 32 | 16 | 16 | 8 | | *P* | 2 | 2 | 2 | 2 | | *dv* (m) | 0.5 | 0.5 | 0.5 | 0.5 | | *dh* (m) | 0.5 | 0.5 | 0.5 | 0.5 | | *range* (deg.) | 90 to 120 | 90 to 120 | 90 to 120 | 60 to 120  (1) | | *range* (deg.) | -60 to 60 | -60 to 60 | -60 to 60 | -60 to 60  (1) | | *Ptx*(dBm) | 2 | 2 | 2 | 2 | | Note 1: Ceiling mounted base station is considered | | | | | |
| R4-2112146 | Qualcomm CDMA Technologies | UE Minimum conducted power is assumed as -20dBm. |

## Open issues summary and companies views’ collection for 1st round

### Sub-topic 1-1

**Issue 1-1: Synchronization assumption of indoor scenario**

* Proposals
  + Option 1: Proposals in R4-2114694
    - Proposal 1: Further study for coexistence in dynamic time-division duplex (D-TDD) systems is required in indoor scenarios.
    - Proposal 2: study of timing asynchronous scenario which can affect TP loss caused by ACIR for indoor scenarios.
  + Option 2: Synchronized TDD is assumed as TR 38.803
* Recommended WF
  + To be discussed

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX |  |
| Qualcomm | We support option 2. Although dynamic TDD and asynchronous deployments might give us deeper insights on the interference dynamics within the network, we believe that for defining the RF requirements, focus should be on the synchronized TDD operation at the time being. |
| Nokia | Support Option 2, Option 1 is not typical type of simulation for ACLR/ACS. |
| CATT | Support option 2. |
| Ericsson | We support Option 2. D-TDD maybe be very interesting but sort of outside the scope of this WI |
| vivo | Support Option 2. |

### Sub-topic 1-2

**Issue 1-2: UE EIRP limit assumption**

* Proposals
  + Option 1: Proposal in R4-2112997

**Proposal 2: For UL coexistence study, the EIRP limit and power control parameters should be further studied.**

* + Option 2: Keep current assumption in WF R4-2107915
* Recommended WF
  + To be discussed

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX |  |
| Qualcomm | We support option 2. Simulation parameters, specifically EIRP limits has been discussed and agreed during the last RAN4#99-e meeting. The deteriorated UL performance reported in R4-2112997 can be attributed to the large CL-xile values selected. We can discuss UL SNR targets and from there appropriate CL-xile values can be evaluated. |
| Nokia | Support Option 2, and we see no need to perform further simulation. |
| CATT | We’re ok with option 2 if all of the companies are ok. But we also observed UL SINR is very low for UMi scenario and the reason may be that UE power is limited. |
| Ericsson | We support Option 2 as base line. However, there are some details on the antenna model parameters which should be further considered (R4-2113316). |
| vivo | Our concern is that current EIRP limit will cause the UL SINR very low in Umi scenario, which means the UE cannot work normally. However, we also agree with Qualcomm’s view that the CL-xile should be re-evaluated. If all companies believe the current EIRP limit is reasonable, we are also OK with option 2. |
| CATT | Moderator had some offline discussion with some companies on how to handle UMi scenario. There’re two suggestions on the table: 1) cell size shrinking, 2) only simulate indoor. |

### Sub-topic 1-3

**Issue 1-3: UE power control parameters**

* Proposals
  + Parameter used in R4-2112997
    - CLx-ile is selected as 116
  + Parameter used in R4-2112146
    - UE minimum conducted power is -20 dBm.
* Recommended WF
  + To be discussed

Moderator assumes the power control scheme in TR 38.803 will be reused, but some parameters may need to be modified.

===================

For uplink scenario, TPC model specified in Section 9.1 TR 36.942 is applied



with following parameters.

- CLx-ile = 88 + 10\*log10(200/X), where X is UL transmission BW (MHz)

- γ = 1

====================

Companies can comment the understanding, which parameter should be aligned and what value should be used.

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX |  |
| Qualcomm | We support the methodology followed in R4-2112146. An appropriate CL-xile value can be derived based on system parameters such as the SNR target, noise floor, and conducted power. |
| Nokia | UL SNR target should be 15dB, 88 is obtained as {23 – [10log10(2e8) – 174 + 11 + 15], and UE minimum conducted power would only impact the tail of the UL SINR curve so should not make notable difference to the TP Vs ACIR results. |
| CATT | To our understanding, Rmin and CLx-ile may need to be decided to continue the calibration. |
| vivo | A reasonable SNR target should be reconsidered to conclude the CL-xile, and it is noted that 15dB SNR target means almost all UE will be working with full power. |

### Sub-topic 1-4

**Issue 1-4: BS antenna model parameter**

* Proposals
  + Option 1: Proposal1 in R4-2113316
    - **Proposal 1:** It is proposed to use antenna model parameter sets in Table 2.1-2 if co-existence simulations are considered or if antenna parameters are shared to other groups.

**Table 2.1-2: Deployment scenarios**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | **Sub-urban** | **Urban** | **Dense urban** | **Indoor** |
| *Am* (dB) | 30 | 30 | 30 | 30 |
| *SLAv* (dB) | 30 | 30 | 30 | 30 |
| *3dB* (deg.) | 90 | 90 | 90 | 90 |
| *3dB* (deg.) | 90 | 90 | 90 | 90 |
| *GE,max* (dBi) | 5.3 | 5.3 | 5.3 | 5.3 |
| *LE* (dB) | 2.2 | 2.2 | 2.2 | 2.2 |
| *M* | 32 | 16 | 8 | 4 |
| *N* | 32 | 16 | 16 | 8 |
| *P* | 2 | 2 | 2 | 2 |
| *dv* (m) | 0.5 | 0.5 | 0.5 | 0.5 |
| *dh* (m) | 0.5 | 0.5 | 0.5 | 0.5 |
| *range* (deg.) | 90 to 120 | 90 to 120 | 90 to 120 | 60 to 120  (1) |
| *range* (deg.) | -60 to 60 | -60 to 60 | -60 to 60 | -60 to 60  (1) |
| *Ptx*(dBm) | 2 | 2 | 2 | 2 |
| Note 1: Ceiling mounted base station is considered | | | | |

* + Option 2: Keep current assumption in WF R4-2107915
* Recommended WF
  + To be discussed

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX |  |
| Qualcomm | We support option 2. Antenna configuration for BS and UE has already been discussed and agreed during the past two RAN4 meetings. |
| Nokia | Support Option 2, and we see no need to perform further simulation. |
| CATT | Support option 2. |
| Ericsson | The intention with the parameters in R4-2113316 was to remove all uncertainties related to the antenna normalization error that can be expected if parameters are selected in the wrong way. Also, we didn’t see all relevant deployment scenarios for licensed and unlicensed operation. |
| vivo | Support option 2. |

### Sub-topic 1-5

**Issue 1-5: Other simulation assumptions**

* Proposals
  + None
* Recommended WF
  + To be discussed

Companies can comment if any other different simulation assumptions compared with WF R4-2107915 should be revisited and decided.

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX |  |
| Qualcomm | We can discuss possible values for SNR target and minimum conducted power to address unclear parameters for UL scenarios. |
| Nokia | UL SNR target should be 15dB, UE minimum conducted power should not make notable difference to the TP Vs ACIR results, and we see no need to perform further simulation. |
| CATT | UL SNR target, minimum conducted power which leads to the power control parameters may need to be aligned. |
| vivo | The UL power control related parameter need to be discussed. |

## Summary for 1st round

### Open issues

*Moderator tries to summarize discussion status for 1st round, list all the identified open issues and tentative agreements or candidate options and suggestion for 2nd round i.e. WF assignment.*

|  |  |
| --- | --- |
|  | **Status summary** |
| **Issue 1-1: Synchronization assumption of indoor scenario** | According to the 1st round discussion, companies think dynamic TDD is important but is not appropriate to be assumed in the co-existence simulation. So option 2: Synchronized TDD is assumed as TR 38.803 can be kept for the simulation.  **Tentative agreements:**  Synchronized TDD is assumed as TR 38.803  **Recommendations for 2nd round:** No discussion on this issue. |
| **Issue 1-2: UE EIRP limit assumption** | Many companies observed the UE EIRP limitation in UMi scenario. One of the possible reasons mentioned by companies is the large CLx-tile. Another issue was raiseed in the moderator’s offline discussion with some companies, which is how to handle UMi scenario. There’re two suggestions on the table: 1) cell size shrinking, 2) only simulate indoor. This issue can also be discussed in the 2nd round.  **Tentative agreements:**  Keep UE EIRP assumption in WF R4-2107915. Discuss how to handle UMi scenario and CLx-ile in the second round.  **Recommendations for 2nd round:** Further discuss how to handle UMi scenario and CLx-ile in the WF. |
| **Issue 1-3: UE power control parameters** | According the good discussion in 1st round, companies think UL SNR target, minimum UE conducted power and CLx-ile need to be discussed and decided.  **Tentative agreements:**  UL SNR target, minimum UE conducted power and CLx-ile need to be discussed and decided.  **Recommendations for 2nd round:** Discuss UL SNR target, minimum UE conducted power and CLx-ile in the WF. |
| **Issue 1-4: BS antenna model parameter** | Most companies prefer to keep the current assumption in WF R4-2107915.  **Tentative agreements:**  Keep the current assumption in WF R4-2107915.  **Recommendations for 2nd round:** No discussion in the 2nd round. |
| **Issue 1-5: Other simulation assumptions** | Companies mentioned the same parameters with issue 1-3, so there’re no new proposals in this issue. If any new issues will be found in 2nd round, they can be discussed in the WF.  **Tentative agreements:**  No new observations compared with issue 1-3.  **Recommendations for 2nd round:** No discussion in the 2nd round. |

## Discussion on 2nd round (if applicable)

Discuss R4-2114993 WF on co-existence simulation for NR\_ext\_to\_71GHz, please put your comments directly in the WF.

# Topic #2: Calibration and alignment

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2114693 | CATT | **Table 2.1-1: ACIR simulation results for indoor scenario, DL 5% throughput loss**   |  |  |  | | --- | --- | --- | |  | 100 MHz | 400 MHz | | 60 GHz average | 13.5 dB | 13.5 dB | | 60 GHz edge | 22.5 dB | 22.5 dB | | 70 GHz average | 15 dB | 15 dB | | 70 GHz edge | 23 dB | 23 dB |   **Table 2.1-2: ACIR simulation results for indoor scenario, UL 5% throughput loss**   |  |  |  | | --- | --- | --- | |  | 100 MHz | 400 MHz | | 60 GHz average | 0 dB | 0 dB | | 60 GHz edge | 2 dB | 1dB | | 70 GHz average | 0 dB | 0 dB | | 70 GHz edge | 4.5 dB | 3 dB |   **Table 2.2-1: ACIR simulation results for dense urban scenario, DL 5% throughput loss**   |  |  |  | | --- | --- | --- | |  | 100 MHz | 400 MHz | | 60 GHz average | 8.5 | 6.5 | | 60 GHz edge | 0 | 0 | | 70 GHz average | 10.5 | 8.5 | | 70 GHz edge | 0 | 0 |   **Table 2.2-2: ACIR simulation results for dense urban scenario, UL 5% throughput loss**   |  |  |  | | --- | --- | --- | |  | 100 MHz | 400 MHz | | 60 GHz average | 0 | 0 | | 60 GHz edge | 0 | 0 | | 70 GHz average | 0 | 0 | | 70 GHz edge | 0 | 0 |   The confirmation of the simulation assumption and the calibration between different companies are needed. |
| R4-2114694 | Korea Testing Laboratory | **Observation: For NR DL at 60 GHz carrier frequency, ACIR would be limited by 16.5 dB for co-existence support to prevent more than 5% TP loss.** |
| R4-2112146 | Qualcomm CDMA Technologies | **Observation 1: For indoor deployments, an ACIR of 15 and 13.7 dB would be enough to keep degradation due to ACI within 5% loss for DL and UL, respectively.**  **Observation 2: For dense deployment scenarios (i.e., coordinated, and uncoordinated), the system is noise limited. For UL, with the current assumptions is not possible to close the link budget. For downlink, a very low ACIR (around 6 dB) would be enough to keep degradation due to ACI within 5% loss, this is because the impact of noise is dominating, making adjacent channel interference less relevant in terms of relative throughput degradation.**  **Observation 3: We can consider the ACIR limits considered in TR 38.803 for 70 GHz as a basis for 52.6-71 GHz. The ACIR limit is driven by indoor deployment scenario (while UMi scenario is highly noise limited).** |
| R4-2112997 | vivo | Table 2. Summary of co-existence simulation results   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | Indoor office | | Dense urban | | | 60G | 70G | 60G | 70G | | DL: ACIR (5% TP loss) | 15 dB | 15 dB | 0 dB | 0 dB | | UL: ACIR (5% TP loss) | 0 dB | 0 dB | 0 dB | 0 dB |   **Observation 1: The ACIR value meeting 5% throughput loss is 15 dB in 60/70 GHz frequency for indoor office scenario.**  **Observation 2: In UL, the throughput loss for indoor case is rather low for 60/70 GHz frequency.**  **Observation 3: In DL, the throughput loss would not exceed the 5% criterion for the dense urban scenario.**  **Observation 4: In Dense urban scenario, the UL SINR cannot reach the minimum value to calculate the throughput, in this case UL throughput is 0.**  **Proposal 1: For DL case, re-evaluate ACIR for 60/70 GHz carrier frequency.**  **Proposal 2: For UL coexistence study, the EIRP limit and power control parameters should be further studied.** |
| R4-2113924 | ZTE Corporation | **Observation: more stringent DL ACIR requirement are needed for 52.6-71GHz due to different antenna configuration and lower output power limit.**  Table 5.5-9S: Interpolated ACIR values for DL to meet the 5% throughput loss criteria at 70GHz   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **Scenario** | | **Indoor** | | **Dense urban** | | | **NF [dB]** | | **13** | **15** | **13** | **15** | | **ZTE** | **Average** | 9.25 | 9.10 | 5.00 | 5.00 | | **5%-tile** | 19.21 | 18.13 | NA | NA |   Table 2. simulation results for uplink in indoor scenario   |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | sCase | ACIR [dB] | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | | 60GHz, 100MHz | Average throughput loss | 0.32 | 0.10 | 0.03 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | | Cell edge through loss | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | | 60GHz, 400MHz | Average throughput loss | 0.13 | 0.04 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | Cell edge through loss | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | | 70GHz, 100MHz | Average throughput loss | 0.22 | 0.08 | 0.03 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | | Cell edge through loss | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | | 70GHz, 400MHz | Average throughput loss | 0.09 | 0.03 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | Cell edge through loss | NaN | NaN | NaN | NaN | NaN | NaN | NaN | NaN | |
| R4-2112277 | Nokia, Nokia Shanghai Bell | Observation 1) Scenario Indoor-C is a more stringent case compared to Scenario Outdoor-A in term of the required downlink and uplink ACIR to limit the average and 5%-tile downlink throughput losses of the victim UE to 5%.  Observation 2) The average and 5%-tile downlink throughput losses of the victim UE can only be limited to 5% in the simulated Scenario Indoor-C with downlink ACIR offsets of 1dB (i.e. 1dB more stringent ACIR compared to the ACIR using 23.5dB BS ACLR and 20.5dB UE ACS).  Observation 3) The average and 5%-tile uplink throughput losses of the victim UE can only be limited to 5% in the simulated Scenario Indoor-C with uplink ACIR offsets of 4dB (i.e. 4dB more stringent ACIR compared to the ACIR using 15dB UE ACLR and 21.5dB BS ACS).  Therefore, our preliminary simulation results show there is no technical justification to relax the required ACIR values compared to the current ones in TR 38.803 at 70GHz carrier frequency.  Observation 4) There is no technical justification to relax the required ACIR values compared to the current ones in TR 38.803 at 70GHz carrier frequency**.**  Hence it is proposed that:  **Proposal 1) New coexistence simulation is not required and the results in TR 38.803 can be reused to decide the required ACIR values for extending current NR operation to 71 GHz.** |

## Companies’ comments for simulations results for 1st round

If there’s any questions/comments for the simulation results, companies can comment and respond here.

|  |  |
| --- | --- |
| **Tdoc number** | **Comments collection** |
| R4-2114693  Some co-existence simulation results for 57-71 GHz, CATT | Company A |
| Company B |
|  |
| R4-2114694  Simulation results for NR DL coexistence study: indoor deployment at 60GHz, Korea Testing Laboratory | Company A |
| Company B |
|  |
| R4-2112146  NR coexistence simulation results for 52.6-71 GHz, Qualcomm CDMA Technologies | Company A |
| Company B |
|  |
| R4-2112997  Initial simulation results for coexistence studies, vivo | Company A |
| Company B |
|  |
| R4-2113924  Initial coexistence simulation results for 52.6-71GHz, ZTE Corporation | Company A |
| Company B |
|  |
| R4-2112277  Proposals on coexistence simulation for extending current NR operation to 71 GHz, Nokia, Nokia Shanghai Bell | Company A |
| Company B |
|  |

## Open issues summary

According to the contributions provided in this meeting, moderator thinks calibration between companies is needed. Companies need to agree what needs to be calibrated for the simulation.

### Sub-topic 2-1

**Issue 2-1: What need to be calibrated for the simulation?**

* Recommended WF
  + DL SINR/SNR cdf, UL SINR/SNR cdf, coupling loss cdf
  + Others (?)

Companies please comment or propose what needs to calibrated for the co-existence simulation.

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX |  |
| Qualcomm | We would like to agree on the supported parameters that were captured in WF R4-2107915. We can calibrate and align offline between RAN4#100e and RAN4#101e to decide on final ACIR requirements in RAN4#101e. Companies also should highlight differences to the provided requirements in TR 38.803, as has been discussed already during RAN4#99-e which is captured in WF R4-2107915.  Additional comments before the DL of first round: It was agreed in RAN#99-e that the RF requirements (e.g., ACLR and ACS) can be derived based on coexistence study results resulting from the list of simulation parameters in WF R4-2107915 while keeping in mind the difference to the assumptions and parameters considered in TR 38.803. We can do the calibration to align, but we need to have preliminary insights on whether the reported current results are different from TR 38.803 or not. |
| Nokia | We see no need to perform further simulation, the calibration steps used for the simulation results in TR 38.803 can be found in R4-1610157. |
| CATT | Thanks Nokia for providing the background. Then for TR 38.803, the calibration is as flowing steps: 1) path loss. 2) path loss + BS antenna element gain, path loss + UE antenna element gain. 3) path loss + BS antenna array gain, path loss + UE antenna array gain. 4) path loss + BS antenna array gain + UE antenna array gain. 5) DL SINR at victim system. 6) UL SINR at victim system.  We think maybe we can calibrate 1), 5) and 6) first. If there’s a need then calibrate more according the the previous experience. |
| Ericsson | It seems that simulation results for considered deployments aligns well with previous results in TR 38.803. |
| ZTE | Prefer to do coexistence simulation again since lots of assumption in TR 38.803 is not valid for 52.6-71GHz. In TR 38.803, coexistence simulation is not done appropriately, companies are encouraged to check the following parameters from TR 38.803, in the WI phase, BS max Tx power is identified as wrong assumption and UE max Tx power is also not correct.    Again, we have concerns that TR 38.803 simulation results could be reused without any further considerations; |
| vivo | We prefer simplify the calibration step in TR 38.803, and only keep the following steps:   1. Coupling loss (path loss + BS antenna array gain + UE antenna array gain) 2. DL SINR at victim system   UL SINR at victim system |

## Summary for 1st round

### Open issues

*Moderator tries to summarize discussion status for 1st round, list all the identified open issues and tentative agreements or candidate options and suggestion for 2nd round i.e. WF assignment.*

|  |  |
| --- | --- |
|  | **Status summary** |
| **Issue 2-1: What need to be calibrated for the simulation?** | Companies discussed this issue and also referred the calibration steps for R15 NR co-existence simulation, some preferences were showed for the calibration. The following steps are preferred according to the comments from companies,   1. Path loss 2. Coupling loss (path loss + BS antenna array gain + UE antenna array gain) 3. DL SINR at victim system 4. UL SINR at victim system   **Tentative agreements:**  Take the following as the candidates of the calibration steps:   1. Path loss 2. Coupling loss (path loss + BS antenna array gain + UE antenna array gain) 3. DL SINR at victim system 4. UL SINR at victim system   Further discuss the above candidates in 2nd round, down select is not excluded.  **Recommendations for 2nd round:**  Discuss the candidates of the calibration steps and seek agreement in this meeting. |

## Discussion on 2nd round (if applicable)

Discuss R4-2114993 WF on co-existence simulation for NR\_ext\_to\_71GHz, please put your comments directly in the WF.

# Topic #3: Work plan for future meetings

According to the contributions provided in this meeting, moderator thinks it’ll be good that a work plan is set and agreed to guarantee the co-existence simulation progress.

## Open issues summary

### Sub-topic 3-1

**Issue 3-1: Work plan for the co-existence simulation**

* Recommended WF
  + RAN4#100e: Agree the simulation assumption and the calibration aspects.
  + During the period between RAN4#100e and RAN4#101e: Offline calibrate between the companies.
  + RAN4#101e: Calibrate and align the simulation results, try to agree preliminary ACIR.
  + RAN4#101b-e: Further update simulation results if any, agree the final ACIR requirement.

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX |  |
| CATT | We can agree the plan is there’s no comment. |
| vivo | OK with the work plan. |
| Qualcomm | We are ok with the proposed plan. Companies need to consider the reported results in TR 38.803 as agreed in WF R4-2107915. |

## Summary for 1st round

### Open issues

*Moderator tries to summarize discussion status for 1st round, list all the identified open issues and tentative agreements or candidate options and suggestion for 2nd round i.e. WF assignment.*

|  |  |
| --- | --- |
|  | **Status summary** |
| **Issue 3-1: Work plan for the co-existence simulation** | Companies seem being ok with the proposed work plan, then it can be set as the tentative agreements in the 1st round. Any improvement also can be done in the 2nd round.  **Tentative agreements:**   * + RAN4#100e: Agree the simulation assumption and the calibration aspects.   + During the period between RAN4#100e and RAN4#101e: Offline calibrate between the companies.   + RAN4#101e: Calibrate and align the simulation results, try to agree preliminary ACIR.   + RAN4#101b-e: Further update simulation results if any, agree the final ACIR requirement.   **Recommendations for 2nd round:** Further confirm the above work plan in the WF. |

## Discussion on 2nd round (if applicable)

Discuss R4-2114993 WF on co-existence simulation for NR\_ext\_to\_71GHz, please put your comments directly in the WF.

# Recommendations for Tdocs

## 1st round

Please capture the following agreements in the chairman notes. They will not be included in the 2nd round WF.

**Issue 1-1: Synchronization assumption of indoor scenario**

Synchronized TDD is assumed as TR 38.803

**Issue 1-2: UE EIRP limit assumption**

Keep UE EIRP assumption in WF R4-2107915.

**Issue 1-4: BS antenna model parameter**

Keep the current assumption in WF R4-2107915.

**New tdocs**

|  |  |  |
| --- | --- | --- |
| **Title** | **Source** | **Comments** |
| WF on co-existence simulation for NR\_ext\_to\_71GHz | Qualcomm |  |
|  |  |  |

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-210xxxx | CR on … | XXX | Agreeable, Revised, Merged, Postponed, Not Pursued |  |
| R4-2114693 | Some co-existence simulation results for 57-71 GHz | CATT | Noted |  |
| R4-2114694 | Simulation results for NR DL coexistence study: indoor deployment at 60GHz | Korea Testing Laboratory | Noted |  |
| [R4-2112146](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2112146.zip) | NR coexistence simulation results for 52.6-71 GHz | Qualcomm CDMA Technologies | Noted |  |
| [R4-2112997](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2112997.zip) | Initial simulation results for coexistence studies | vivo | Noted |  |
| [R4-2113924](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2113924.zip) | Initial coexistence simulation results for 52.6-71GHz | ZTE Corporation | Noted |  |
| [R4-2112277](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2112277.zip) | Proposals on coexistence simulation for extending current NR operation to 71 GHz | Nokia, Nokia Shanghai Bell | Noted |  |

Notes:

1. Please include the summary of recommendations for all tdocs across all sub-topics incl. existing and new tdocs.
2. For the Recommendation column please include one of the following:
   1. CRs/TPs: Agreeable, Revised, Merged, Postponed, Not Pursued
   2. Other documents: Agreeable, Revised, Noted
3. For new LS documents, please include information on To/Cc WGs in the comments column
4. Do not include hyper-links in the documents

## 2nd round

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-2114993 | WF on co-existence simulation for NR\_ext\_to\_71GHz | Qualcomm | Agreeable |  |

Notes:

1. Please include the summary of recommendations for all tdocs across all sub-topics.
2. For the Recommendation column please include one of the following:
   1. CRs/TPs: Agreeable, Revised, Merged, Postponed, Not Pursued
   2. Other documents: Agreeable, Revised, Noted
3. Do not include hyper-links in the documents

# Annex

Contact information

|  |  |  |
| --- | --- | --- |
| **Company** | **Name** | **Email address** |
| Nokia | Man Hung Ng | man\_hung.ng@nokia.com |
| CATT | Huiping Shan | shanhuiping@catt.com |
| Ericsson | Torbjorn Elfstrom | torbjorn.elfstrom@ericsson.com |
| ZTE | Fei Xue | xue.fei25@zte.com.cn |
| vivo | Shuai Zhou | shuai.zhou@vivo.com |
| Qualcomm | Mustafa Emara | memara@qti.qualcomm.com |

Note:

1. Please add your contact information in above table once you make comments on this email thread.
2. If multiple delegates from the same company make comments on single email thread, please add you name as suffix after company name when make comments i.e. Company A (XX, XX)