**3GPP TSG-RAN WG4 Meeting # 98-bis-e R4-2105682**

**Electronic Meeting, 12th – 20th April, 2021**

**Agenda item:** 5.7.1, 5.7.2.1, 5.7.2.2

**Source:** Moderator (CATT)

**Title:** Email discussion summary for [98-bis-e][212] NR\_CSIRS\_L3meas\_1

**Document for:** Information

# Introduction

The documents in agenda items 5.7.1, 5.7.2.1 and 5.7.2.2 contain the following 2 main topics:

* Topic #1: CSI-RS RRM core requirements maintenance
* Topic #2: CSI-RS RRM performance requirements.
	+ Topic #2.1 CSI-RSRP requirements
	+ Topic #2.2 CSI-RSRQ requirements
	+ Topic #2.3 CSI-SINR requirements

# Topic #1: CSI-RS RRM core requirements maintenance

## Companies’ contributions summary

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| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2104692 | Xiaomi | **Proposal 1: When UE performs CSI-RS intra-frequency measurements in a TDD band, UE is not expected to transmit on data OFDM symbols overlapped by CSI-RS resource symbols to be measured, and 1 OFDM symbols before and after each consecutive CSI-RS symbols, where the serving cell is taken as the symbol level timing reference.** **Observation: If different CSI-RS resources in the same MO fall in different window occasions, the throughput performance degradation is expected from network point of view.****Proposal 2: All CSI-RS resources in the same MO are configured in the same 5ms window.** |
| R4-2104733 | CATT | **Proposal 1: When UE performs CSI-RS intra-frequency measurements in a TDD band, UE is not expected to transmit PUCCH/PUSCH/SRS on CSI-RS resource symbols to be measured, and on 1 OFDM symbol before and after each consecutive CSI-RS symbols to be measured.****Proposal 2: For the applicability of CSI-RS L3 measurement on the CSI-RS configuration, one of the following options can be accepted:** * **Option 1: All CSI-RS resources in the same MO are configured in the same 5ms window.**
* **Option 2: The CSI-RS resources can be configured as**

$$Mod\left(\left|Off\_{i}-Off\_{i}\right|, 20\right) \leq 5$$**where** $Off\_{i}$ **and** $Off\_{j}$ **are time offsets (in millisecond) of CSI-RS resource i and j respectively.** **Proposal 3: There is no need to define the starting point of the 5ms time window.** |
| R4-2104734 | CATT | **Draft CR** |
| R4-2104836 | Apple | **Proposal 1a: for CSI-RS based L3 intra-frequency measurement, the starting point of the 5ms window is the slot boundary of the serving cell, where the corresponding slot contains the first configured L3 CSI-RS resource of the serving cell in the intra-frequency MO.****Proposal 1a: for CSI-RS based L3 intra-frequency measurement, the starting point of the 5ms window is the boundary of slot N in the serving cell, where the following slot, i.e. slot N+1, contains the first configured L3 CSI-RS resource of the serving cell in the intra-frequency MO.****Proposal 2: Single periodicity and frequency offset is defined for all CSI-RS resources in the same MO. Consequently, all CSI-RS resources in the same MO should be configured in the same 5ms window.** |
| R4-2106410 | Nokia, Nokia Shanghai Bell | **Proposal1: We propose using the same way as in SSB-based measurements to define the scheduling restriction for CSI-RS based measurement, i.e. Option 2 is preferred:** * **When UE performs CSI-RS intra-frequency measurements in a TDD band, UE is not expected to transmit PUCCH/PUSCH/SRS on CSI-RS resource symbols to be measured, and on 1 OFDM symbol before and after each consecutive CSI-RS symbols to be measured.**

**Proposal2: Different CSI-RS resources in the same MO may fall in different 5ms window.** **Proposal3: It is unnecessary to specify the starting point as the location of the 5ms window is up to network configuration.****Proposal4: In Rel16, the UE is not required to measure the CSI-RS resource if the timing difference exceeds a threshold.**  |
| R4-2106459 | Intel Corporation | **Proposal 1: All CSI-RS resources in the same MO are configured in the same 5ms window.****Proposal 2: It’s better that NW can order these timing offset of CSI-RS resources and make sure that the first configured L3 CSI-RS resource corresponding to the smallest offset.****Proposal 3: For CSI-RSRP, the upper bound of timing offset for case 1 is 1CP.** |
| R4-2106525 | OPPO | **Proposal 1: Requirement are defined for the cases where all CSI-RS resources in the same MO are configured in the same 5ms window.****Proposal 2: Define the starting point of the 5ms window as the slot boundary of the first configured L3 CSI-RS resource is located.****Proposal 3: Support option 1 that UE is not expected to transmit on data OFDM symbols overlapped by CSI-RS resource symbols to be measured, and 1 OFDM symbols before and after each consecutive CSI-RS symbol.** |
| R4-2106614 | vivo | ***Proposal 1a: All CSI-RS resources in the same MO are configured in the same 5ms window. Or******Proposal 1b: All CSI-RS resources in the same MO are configured in the same 5ms window for inter frequency measurement, and measurement requirements should allow all CSI-RS resources in the same MO are configured in two separated 5ms windows during one CSI-RS resource period for intra frequency measurement.******Proposal 2: Define the starting point of the 5ms window as the slot boundary where the first configured L3 CSI-RS resource during one CSI-RS periodicity is located.******Proposal 3: When UE performs CSI-RS intra-frequency measurements in a TDD band, UE is not expected to transmit PUCCH/PUSCH/SRS on CSI-RS resource symbols, and on 1 OFDM symbol after the consecutive CSI-RS symbols.***  |
| R4-2106620 | vivo | **Draft CR** |
| R4-2106926 | Huawei, HiSilicon | **Proposal 1: as there are some possible understanding of uplink scheduling restriction, there are two options of defining uplink scheduling restrictions in TDD band in FR1:****- Option 1: If we regard the guard period before UL symbols as the scheduling restriction, the uplink scheduling restriction is: CSI-RS resource symbols to be measured, and 1 OFDM symbol (for 15kHz/30kHz SCS) or 2 OFDM symbols (for 60kHz) before CSI-RS resource symbols to be measured,** **and 1 OFDM symbol after CSI-RS resource symbols to be measured.****- Option 2: without considering GP, the uplink scheduling restriction is: CSI-RS resource symbols to be measured, and 1 OFDM symbol before and after CSI-RS resource symbols to be measured.****Proposal 2: Support the case where different CSI-RS resources in the same MO fall in different 5ms windows.****Proposal 3: RAN4 to further discuss the following options for defining CSI-RS measurement window.*** **Based on configured CSI-RS resources, which requires SFN level sync from NW**
* **Based on measured CSI-RS resources, which leads to the sliding window**
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| R4-2106927 | Huawei, HiSilicon | **Draft CR** |
| R4-2106928 | Huawei, HiSilicon | **Draft CR** |
| R4-2106929 | Huawei, HiSilicon | **Draft CR** |
| R4-2107218 | Qualcomm CDMA Technologies | **Observation1: further discussions are needed for distributing CSI-RS resources into multiple windows but RAN4 has limited time remained for this work item.****Proposal1: RAN4 may consider option2(multiple windows per resource period) in the future release if needed.****Proposal2: For a CSI-RS layer, the slot boundary of the resource with the smallest (slot) offset can be treated as the starting point of the 5ms window.****Proposal2.1: in other words, option2 can be clarified as defining the starting point of 5-ms window as the slot boundary of the resource with smallest offset for a CSI-RS frequency layer.****Proposal3: When UE performs CSI-RS intra-frequency measurements in a TDD band, UE is not expected to transmit PUCCH/PUSCH/SRS on CSI-RS resource symbols to be measured, and on 1 OFDM symbol before and after each consecutive configured CSI-RS.****Proposal3.1: restricted CSI-RS symbols are corresponding to the CSI-RS resources configured by the network.** |
| R4-2107365 | Qualcomm CDMA Technologies | **Observation1: further discussions are needed for distributing CSI-RS resources into multiple windows but RAN4 has limited time remained for this work item.****Proposal1: RAN4 may consider option2(multiple windows per resource period) in the future release if needed.****Proposal2: For a CSI-RS layer, the slot boundary of the resource with the smallest (slot) offset can be treated as the starting point of the 5ms window.****Proposal2.1: in other words, option2 can be clarified as defining the starting point of 5-ms window as the slot boundary of the resource with smallest offset for a CSI-RS frequency layer.****Proposal3: When UE performs CSI-RS intra-frequency measurements in a TDD band, UE is not expected to transmit PUCCH/PUSCH/SRS on CSI-RS resource symbols to be measured, and on 1 OFDM symbol before and after each consecutive configured CSI-RS.****Proposal3.1: restricted CSI-RS symbols are corresponding to the CSI-RS resources configured by the network.** |

## Open issues summary

### Sub-topic 1-1 Scheduling restriction for intra-f CSI-RS measurement in TDD band

* Proposals
	+ Option 1: (Xiaomi, OPPO)
		- When UE performs CSI-RS intra-frequency measurements in a TDD band, UE is not expected to transmit on data OFDM symbols overlapped by CSI-RS resource symbols to be measured, and 1 OFDM symbols before and after each consecutive CSI-RS symbols, where the serving cell is taken as the symbol level timing reference
	+ Option 2: (CATT, Nokia, Huawei)
		- When UE performs CSI-RS intra-frequency measurements in a TDD band, UE is not expected to transmit PUCCH/PUSCH/SRS on CSI-RS resource symbols to be measured, and on 1 OFDM symbol before and after each consecutive CSI-RS symbols to be measured.
	+ Option 2a: (Qualcomm)
		- When UE performs CSI-RS intra-frequency measurements in a TDD band, UE is not expected to transmit PUCCH/PUSCH/SRS on configured CSI-RS resource symbols, and on 1 OFDM symbol before and after each consecutively configured CSI-RS symbols.
	+ Option 3: (vivo)
		- When UE performs CSI-RS intra-frequency measurements in a TDD band, UE is not expected to transmit PUCCH/PUSCH/SRS on CSI-RS resource symbols, and on 1 OFDM symbol after the consecutive CSI-RS symbols
* Recommended WF
	+ *Need more discussion*

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| Sub-topic 1-1 Scheduling restriction for intra-f CSI-RS measurement in TDD band |
| **Company** | **Comments** |
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### Sub-topic 1-2 Time domain restriction for CSI-RS configuration

**Issue 1-2: Whether the CSI-RS resources in the same MO can be configured in the different 5ms window?**

* Proposals
	+ Option 1: (Xiaomi, CATT, Apple, Intel, OPPO, vivo, Qualcomm)
		- No. All CSI-RS resources in the same MO are configured in the same 5ms window.
	+ Option 2a: (Nokia, Huawei)
		- Yes. Different CSI-RS resources in the same MO may fall in different 5ms window
	+ Option 3a: (CATT)
		- The CSI-RS resources can be configured as

$$Mod\left(\left|Off\_{i}-Off\_{i}\right|, 20\right) \leq 5$$

where $Off\_{i}$ and $Off\_{j}$ are time offsets (in millisecond) of CSI-RS resource i and j respectively.

* + Option 3b: (vivo)
		- All CSI-RS resources in the same MO are configured in the same 5ms window for inter frequency measurement, and measurement requirements should allow all CSI-RS resources in the same MO are configured in two separated 5ms windows during one CSI-RS resource period for intra frequency measurement.
* Recommended WF
	+ *Need more discussion*

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| Sub-topic 1-2 Time domain restriction for CSI-RS configuration |
| **Company** | **Comments** |
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### Sub-topic 1-3 Starting point of 5ms time window

* Proposals
	+ Option 1: (CATT, Nokia)
		- No need to define the starting point of the 5ms time window
	+ Option 2a: (Apple)
		- For CSI-RS based L3 intra-frequency measurement, the starting point of the 5ms window is the slot boundary of the serving cell, where the corresponding slot contains the first configured L3 CSI-RS resource of the serving cell in the intra-frequency MO.
	+ Option 2b: (Apple)
		- For CSI-RS based L3 intra-frequency measurement, the starting point of the 5ms window is the boundary of slot N in the serving cell, where the following slot, i.e. slot N+1, contains the first configured L3 CSI-RS resource of the serving cell in the intra-frequency MO.
	+ Option 3: (Qualcomm)
		- Define the starting point of 5-ms window as the slot boundary of the resource with smallest offset for a CSI-RS frequency layer
	+ Option 4: (OPPO, vivo)
		- Define the starting point of the 5ms window as the slot boundary where the first configured L3 CSI-RS resource during one CSI-RS periodicity is located
	+ Option 5: (Intel)
		- NW can order these timing offset of CSI-RS resources and make sure that the first configured L3 CSI-RS resource corresponding to the smallest offset.
	+ Option 6: (Huawei)
		- RAN4 to further discuss the following options for defining CSI-RS measurement window.
			* Based on configured CSI-RS resources, which requires SFN level sync from NW
			* Based on measured CSI-RS resources, which leads to the sliding window
* Recommended WF
	+ *Need more discussion*

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| Sub-topic 1-3 Starting point of 5ms time window |
| **Company** | **Comments** |
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### Sub-topic 1-4 UE behavior when the timing offset exceeds the threshold

* Proposals
	+ Option 1: (Nokia)
		- In Rel16, the UE is not required to measure the CSI-RS resource if the timing difference exceeds a threshold.
* Recommended WF
	+ *Need more discussion*

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| Sub-topic 1-4 UE behavior when the timing offset exceeds the threshold |
| **Company** | **Comments** |
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### Sub-topic 1-5 Time validity of the detected associatedSSB

* Proposals
	+ Option 1: (Huawei)
		- Adding the definition of detected associatedSSB in 9.10.2.5 section: The associatedSSB is detected if it has been meeting the relevant cell identification requirement during the last 5 seconds.
* Recommended WF
	+ *Need more discussion*

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| Sub-topic 1-5 Time validity of the detected associatedSSB |
| **Company** | **Comments** |
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## Companies views’ collection for 1st round

### Open issues

### CRs/TPs comments collection

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| --- | --- |
| **CR/TP number** | **Comments collection** |
| R4-2104734 (CATT) | Company A |
| Company B |
|  |
| R4-2106620 (vivo) | Company A |
| Company B |
|  |
| R4-2106927 (Huawei) |  |
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| R4-2106928 (Huawei) |  |
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| R4-2106929 (Huawei) |  |
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## 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.*

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| --- | --- |
|  | **Status summary**  |
| **Sub-topic #1** | *Tentative agreements:**Candidate options:**Recommendations for 2nd round:* |

### CRs/TPs

*Moderator tries to summarize discussion status for 1st round and provides recommendation on CRs/TPs Status update*

*Note: The tdoc decisions shall be provided in Section 3 and this table is optional in case moderators would like to provide additional information.*

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| --- | --- |
| **CR/TP number** | **CRs/TPs Status update recommendation**  |
| XXX | *Based on 1st round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

## Discussion on 2nd round (if applicable)

# Topic #2: CSI-RS RRM performance requirements

*Main technical topic overview. The structure can be done based on sub-agenda basis.*

## Companies’ contributions summary

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| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2104577 | MediaTek Inc. | **Proposal 1: Specify CSI-RSRP accuracy requirement with the absolute timing offset between UE’s FFT window and the target CSI-RS no larger than CP.** |
| R4-2104578 | MediaTek Inc. | **Proposal 1: Specify CSI-SINR accuracy requirement based on one of the following 2 options on timing offset (TΔ) and Es/Iot side condition*** **Option 1: |TΔ |≤ CP/2 with Es/Iot ≤ 25dB**
* **Option 2: |TΔ |≤ CP with Es/Iot ≤ 0 dB**
 |
| R4-2104735 | CATT | **Observation 1: The measurement accuracy for the timing offset CP and –CP has some small difference, but there is no significant performance gap between them.** **Proposal 1: Specify CSI-RSRP measurement accuracy requirement when the timing offset between target CSI-RS and reference timing is smaller than or equal to CP.**  |
| R4-2104736 | CATT | **Observation 1: The measurement accuracy for the timing offset CP and –CP has some small difference, but there is no significant performance gap between the results.** **Proposal 1: Specify CSI-SINR measurement accuracy requirement when the timing offset between target CSI-RS and reference timing is smaller than or equal to CP, together with the side condition Es/Iot ≤ 15dB.** |
| R4-2104737 | CATT | **Draft CR for CSI-RSRP** |
| R4-2104738 | CATT | **Draft CR for CSI-RSRQ** |
| R4-2104739 | CATT | **Draft CR for CSI-SINR** |
| R4-2104937 | CMCC | **Simulation results for CSI-RSRP** |
| R4-2104938 | CMCC | **Simulation results for CSI-RSRQ** |
| R4-2104940 | CMCC | **Proposal 1: for CSI-RSRP, the upper bound of timing offset is proposed to be CP.** |
| R4-2104941 | CMCC | **Proposal 1: for CSI-RSRQ, the upper bound of timing offset is proposed to be CP.** |
| R4-2104942 | CMCC | **Proposal 1: for the specification of CSI-SINR measurement accuracy requirements, both Es/Iot ≤ [10] dB with timing offset within CP and Es/Iot ≤ [18] dB with timing offset within CP/2 are applied. For the test case, we can choose only one timing offset to design the test case.** |
| R4-2106411 | Nokia, Nokia Shanghai Bell | **Proposal1: The CSI-RS based measurement performance shall be defined when the timing offset is within one CP length.**  |
| R4-2106412 | Nokia, Nokia Shanghai Bell | **Draft CR for CSI-RSRP** |
| R4-2106459 | Intel Corporation | **Proposal 1: All CSI-RS resources in the same MO are configured in the same 5ms window.****Proposal 2: It’s better that NW can order these timing offset of CSI-RS resources and make sure that the first configured L3 CSI-RS resource corresponding to the smallest offset.****Proposal 3: For CSI-RSRP, the upper bound of timing offset for case 1 is 1CP.** |
| R4-2106526 | OPPO | **Observation 1: The absolute measurement error of CSI-RS RSRP with negative timing offset is worse than that of CSI-RS RSRP with positive timing offset.****Observation 2: The absolute measurement error of CSI-RS RSRP can be within ±2.0dB for timing offset within [-0.5\*CP, +0.5\*CP], and ±3.0dB for timing offset within [-CP, +CP].****Observation 3: The relative measurement error of CSI-RS RSRP can be within ±1.5dB for timing offset within [-0.5\*CP, +0.5\*CP], and ±2.0dB for timing offset within [-CP, +CP].** |
| R4-2106527 | OPPO | **Observation 1: The absolute measurement error of CSI-RS RSRQ with negative timing offset is worse than that of CSI-RS RSRQ with positive timing offset.****Observation 2: The absolute measurement error of CSI-RS RSRQ can be within ±2.0dB for timing offset within [-0.5\*CP, +0.5\*CP], and ±3.0dB for timing offset within [-CP, +CP].****Observation 3: The relative measurement error of CSI-RS RSRQ can be within ±1.5dB for timing offset within [-0.5\*CP, +0.5\*CP], and ±2.0dB for timing offset within [-CP, +CP].** |
| R4-2106528 | OPPO | **Observation 1: The absolute accuracy performance of CSI-RS SINR can be found:*** **For AWGN channel at FR1, ±4.0dB for timing offset within [-CP, +CP]**
* **For TDL-A channel at FR2 ±6.0dB for timing offset within [-CP, +CP].**

**Observation 2: The relative accuracy performance of CSI-RS SINR can be found:*** **For AWGN channel at FR1, ±2.0dB for timing offset within [-CP, +CP]**
* **For TDL-A channel at FR2 ±5.50dB for timing offset within [-CP, +CP].**

**Observation 3: The absolute accuracy performance of CSI-RS SINR with negative timing offset is worse than that of CSI-RS SINR with positive timing offset.****Proposal 1: To ensure the absolute and relative accuracy performance of CSI-RS SINR can be reused as those of SSB’s, the upper bound of timing offset can be set within 0.9 CP.****Proposal 2: Option 3 as compromise for the upper limit of Es/Iot for CSI-SINR measurement with timing offset(T△):*** **Option 3: Es/Iot ≤ [12] dB for the case that timing offset is within 0.9\*CP.**
 |
| R4-2106615 | vivo | **Proposal 1: The CSI-RSRP/CSI-RSRQ/CSI-SINR accuracy requirements are applicable when timing offset is within CP.** |
| R4-2106616 | vivo | *Observation 1.* If timining delay between two cells is smaller than CP, the absolute accuary of CSI-RSRP measurement with 5 samples is within ±2 dB in both FR1 and FR2.*Observation 2.* The CSI-RSRP accuracy is comparable between timing offset of CP and 0.9CP.*Observation 3.* The CSI-RSRP accuracy is comparable between corresponding positive timing offset and negative timing offset. |
| R4-2106617 | vivo | *Observation 1.* If timining delay between two cells is smaller than CP, the absolute accuary of CSI-RSRQ measurement with 5 samples is within ±2 dB in both FR1 and FR2.*Observation 2.* The CSI-RSRQ accuracy is comparable between timing offset of CP and 0.9CP.*Observation 3.* The CSI-RSRQ accuracy is comparable between corresponding positive timing offset and negative timing offset. |
| R4-2106618 | vivo | *Observation 1.* If timining delay between two cells is smaller than CP, the absolute accuary of CSI-SINR measurement with 5 samples is within ±2 dB in both FR1 and FR2.*Observation 2.* The CSI-SINR accuracy is comparable between timing offset of CP and 0.9CP.*Observation 3.* The CSI-SINR accuracy is comparable between corresponding positive timing offset and negative timing offset. |
| R4-2106619 | vivo | **Proposal 1a: The upper limit of Ês/Iot for CSI-SINR accuracy can be set as 15dB under the condition of timing offset is within CP/2.****Proposal 1b: The upper limit of Ês/Iot for CSI-SINR accuracy can be set as 25dB under the condition of timing offset is within CP/2 and for AWGN channel only.** |
| R4-2107023 | Huawei, HiSilicon | **Proposal: For CSI-RSRP and CSI-RSRQ the upper bound of timing offset for case 1 is 1\*CP.** |
| R4-2107024 | Huawei, HiSilicon | **Proposal: Define the CSI-SINR accuracy based on timing offset condition 0.9\*CP and the upper bound Es/Iot 6dB.** |
| R4-2107025 | Huawei, HiSilicon | **Draft CR for CSI-SINR** |
| R4-2107214 | Qualcomm CDMA Technologies | **Observation1: trivial degradation of the measurement error for 1CP relative to 0.9CP.****Observation2: simulated accuracy is the baseband accuracy only.** **Proposal1: Same accuracy requirements as SSB based measurements can be resused for CSI-RSRP.****Proposal1.1: Cell timing offset of 1CP or 0.9 CP can be supported as the side condition.** |
| R4-2107215 | Qualcomm CDMA Technologies | **Es/Iot≤20dB with certain margin.****Proposal1: Support to reuse the accuracy requirements of SS-SINR measurement with the side condition of Es/Iot ≤ [18] dB for the case that timing offset is within CP/2** |

## Open issues summary

### Sub-topic 2-1 CSI-RSRP measurement accuracy requirements

**Issue 2-1: Timing offset for specifying CSI-RSRP measurement accuracy requirements**

* Proposals
	+ Option 1: (MTK, CATT, CMCC, Nokia, Intel, vivo, Huawei, Qualcomm)
		- Specify CSI-RSRP accuracy requirement with the absolute timing offset between the reference measurement timing and the target CSI-RS in one layer no larger than CP
* Recommended WF
	+ *Agree on option 1.*

### Sub-topic 2-2 CSI-RSRQ measurement accuracy requirements

**Issue 2-2: Timing offset for specifying CSI-RSRQ measurement accuracy requirements**

* Proposals
	+ Option 1: (CMCC, vivo, Huawei)
		- Specify CSI-RSRQ accuracy requirement with the absolute timing offset between the reference measurement timing and the target CSI-RS in one layer no larger than CP
* Recommended WF
	+ *Agree on option 1.*

### Sub-topic 2-3 CSI-SINR measurement accuracy requirements

**Issue 2-3: Timing offset and upper limit of side condition for specifying CSI-SINR measurement accuracy requirements**

* Proposals
	+ Specify CSI-SINR accuracy requirement based on one of the following options on timing offset between the reference measurement timing and the target CSI-RS (TΔ) and Es/Iot side condition
		- When |TΔ |≤ CP/2
			* Option 1: (MTK, vivo)
				+ Es/Iot ≤ 25 dB for AWGN only
			* Option 2: (Qualcomm)
				+ Es/Iot ≤ [18]dB
		- When |TΔ |≤ CP
			* Option 3: (MTK)
				+ Es/Iot ≤ 0 dB
			* Option 4: (CATT)
				+ Es/Iot ≤ 15 dB
		- When |TΔ |≤ 0.9\*CP
			* Option 5: (OPPO)
				+ Es/Iot ≤ [12] dB
			* Option 6: (Huawei)
				+ Es/Iot ≤ 6dB
		- Option 7: (CMCC)
			* Both |TΔ |≤ CP with Es/Iot ≤ [10] dB and |TΔ |≤ CP/2 with Es/Iot ≤ [18] dB are applied. But choose one to design the test cases.
* Recommended WF
	+ *Need more discussion.*

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| Sub-topic 2-3 CSI-SINR measurement accuracy requirements |
| **Company** | **Comments** |
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## Companies views’ collection for 1st round

### Open issues

### CRs/TPs comments collection

*Major close to finalize WIs and Rel-15 maintenance, comments collections can be arranged for TPs and CRs. For Rel-16 on-going WIs, suggest to focus on open issues discussion on 1st round.*

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| --- | --- |
| **CR/TP number** | **Comments collection** |
| R4-2104737 (CATT) | Company A |
| Company B |
|  |
| R4-2104738 (CATT) | Company A |
| Company B |
|  |
| R4-2104739 (CATT) |  |
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| R4-2106412 (Nokia) |  |
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| R4-2107025 (Huawei) |  |
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## 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.*

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| --- | --- |
|  | **Status summary**  |
| **Sub-topic#1** | *Tentative agreements:**Candidate options:**Recommendations for 2nd round:* |

### CRs/TPs

*Moderator tries to summarize discussion status for 1st round and provided recommendation on CRs/TPs Status update suggestion*

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| --- | --- |
| **CR/TP number** | **CRs/TPs Status update recommendation**  |
| XXX | *Based on 1st round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

## Discussion on 2nd round (if applicable)

*Moderator can provide summary of 2nd round here. Note that recommended decisions on tdocs should be provided in the section titled ”Recommendations for Tdocs”.*

# Recommendations for Tdocs

## 1st round

**New tdocs**

|  |  |  |
| --- | --- | --- |
| **Title** | **Source** | **Comments** |
| WF on … | YYY |  |
| LS on … | ZZZ | To: RAN\_X; Cc: RAN\_Y |
|  |  |  |

**Existing tdocs**

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| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation**  | **Comments** |
| R4-210xxxx | CR on … | XXX | Agreeable, Revised, Merged, Postponed, Not Pursued |  |
| R4-2104734  | draft CR on CSI-RS based L3 measurement | CATT |  |  |
| R4-2106620  | Draft CR to 38.133 Correction on core requirements for CSI-RS based measurement | vivo |  |  |
| R4-2106927  | CR on CSI-RS based intra-frequency scheduling restriction | Huawei |  |  |
| R4-2106928  | CR on CSI-RS measurement window and intra-frequency measurements | Huawei |  |  |
| R4-2106929  | Adding intra-frequency CSI-RS measurement in CSSF | Huawei |  |  |
| R4-2104737  | draft CR on performance requirement for CSI-RSRP | CATT |  |  |
| R4-2104738  | draft CR on performance requirement for CSI-RSRQ | CATT |  |  |
| R4-2104739  | draft CR on performance requirement for CSI-SINR | CATT |  |  |
| R4-2106412  | 38.133 draftCR on the CSI-RSRP accuracy requirements | Nokia |  |  |
| R4-2107025  | draftCR on CSI-SINR accuracy requirements | Huawei |  |  |

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

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| **Tdoc number** | **Title** | **Source** | **Recommendation**  | **Comments** |
| R4-210xxxx | CR on … | XXX | Agreeable, Revised, Merged, Postponed, Not Pursued |  |
| R4-210xxxx | WF on … | YYY | Agreeable, Revised, Noted |  |
| R4-210xxxx | LS on … | ZZZ | Agreeable, Revised, Noted |  |
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