**3GPP TSG-RAN WG4 Meeting # 100-e R4-2115203**

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

**Agenda item:** 6.1.8

**Source:** Moderator (CATT)

**Title:** Email discussion summary for [100-e][213] NR\_CSIRS\_L3meas

**Document for:** Information

# Introduction

The documents in agenda items 6.1.8 contain the following topic:

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

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

## Companies’ contributions summary

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| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2111980 | CATT | **Proposal 1: The conclusions of time domain restriction in FR1 are also applied for FR2.**  **Proposal 2: For UE behavior when the timing offset exceeds the threshold, no spec updates are needed.** |
| R4-2111981 | CATT | **DraftCR** |
| R4-2111982 | CATT | **Cat A of R4-2111981** |
| R4-2112119 | Apple | **DraftCR on CSSF** |
| R4-2112120 | Apple | **Cat A of R4-2112119** |
| R4-2112395 | MediaTek inc. | **Proposal 1: For FR2 inter-frequency measurement, Rel-16 L3 CSI-RS requirements are defined under assumption that all CSI-RS resources in the same MO are configured in the same 5ms window.**  **Proposal 2: For CSI-RS based L3 measurement on FR2 intra-frequency, Rel-16 requirements are defined under assumption that all CSI-RS resources in the same MO are configured in the same 5ms window. Further extension can be considered in later releases.** |
| R4-2112396 | MediaTek inc. | **DraftCR on 2 windows** |
| R4-2112397 | MediaTek inc. | **Cat A of R4-2112396** |
| R4-2112515 | CMCC | **DraftCR on requirements applicability** |
| R4-2112516 | CMCC | **Cat A of R4-2112515** |
| R4-2112539 | vivo | ***Proposal 1: No UE behaviour is specified when timing offset exceeds the threshold.*** |
| R4-2112879 | Nokia, Nokia Shanghai Bell | **Proposal1: In Rel16, the UE is not required to measure or report the CSI-RS resource if the timing difference exceeds a threshold, hence Option 1 is preferred.** |
| R4-2112880 | Nokia, Nokia Shanghai Bell | **DraftCR on timing offset impact** |
| R4-2112881 | Nokia, Nokia Shanghai Bell | **Cat A of R4-2112880** |
| R4-2112882 | Nokia, Nokia Shanghai Bell | **DraftCR on resource periodicity** |
| R4-2112883 | Nokia, Nokia Shanghai Bell | **Cat A of R4-2112882** |
| R4-2112884 | Nokia, Nokia Shanghai Bell | **DraftCR** |
| R4-2112885 | Nokia, Nokia Shanghai Bell | **Cat A of** **R4-2112884** |
| R4-2114299 | Huawei, HiSilicon | **Proposal 1: For FR2 intra-frequency CSI-RS measurement, use the same applicability condition regarding measurement window alignment as SSB measurement.**  **Observation 1: The extra complexity in planning the measurement and Rx beam sweeping due to support of 2 measurement windows for CSI-RS is limited.**  **Observation 2: From NW side, support of 2 measurement windows in FR2 is as necessary as in FR1.**  **Proposal 2: Support 2 measurement windows for FR2 CSI-RS intra-frequency measurement.**  **Proposal 3: No spec update for UE behavior when the timing offset exceeds threshold.** |
| R4-2114300 | Huawei, HiSilicon | **DraftCR on measurement window** |
| R4-2114301 | Huawei, HiSilicon | **Cat A of** **R4-2114300** |

## Open issues summary

### Sub-topic 1-1 Time domain restriction for CSI-RS configuration

Agreements in RAN4#99e meeting:

* + FR1
    - For inter-frequency measurements, Rel-16 L3 CSI-RS requirements are defined under assumption that all CSI-RS resources in the same MO are configured in the same 5ms window
    - For intra-frequency measurements: Rel-16 L3 CSI-RS requirements are defined under assumption that CSI-RS resources in the same MO can be configured in up to two separated 5ms windows during one CSI-RS resource period
      * 1/ The overlapping status with MG is same for the two windows.
        + FFS how to capture this in the specification
      * 2/ The periodicity of the configured CSI-RS resources is 20ms or 40ms.
      * 3/ The gap between two 5ms windows shall be half of the CSI-RS periodicity
      * 4/ Measurement requirements are not impacted by separated 5ms windows.
      * The conditions 1, 2, 3, 4 apply for the case of two separated 5ms windows during one CSI-RS period only.
  + FFS for FR2

**Issue 1-1-1: Whether the conclusions in FR1 are applied to FR2?**

* Proposals
  + Option 1: (CATT, Huawei)
    - Yes
  + Option 2: (MTK)
    - Not applied for intra-frequency measurement.
      * For FR2 inter-frequency measurement, Rel-16 L3 CSI-RS requirements are defined under assumption that all CSI-RS resources in the same MO are configured in the same 5ms window.
      * For CSI-RS based L3 measurement on FR2 intra-frequency, Rel-16 requirements are defined under assumption that all CSI-RS resources in the same MO are configured in the same 5ms window. Further extension can be considered in later releases.
* Recommended WF
  + *Need more discussion.*

**Issue 1-1-2: The applicability condition of CSI-RS measurement window alignment for CSSF requirements?**

* Proposals
  + Option 1: (Huawei)
    - For FR2 intra-frequency CSI-RS measurement, use the same applicability condition regarding measurement window alignment as SSB measurement. (refer to the text in R4-2114300)
* Recommended WF
  + *Need more discussion.*

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| **Sub-topic 1-1 Time domain restriction for CSI-RS configuration** | |
| **Company** | **Comments** |
| CATT | **Issue 1-1-1: Whether the conclusions in FR1 are applied to FR2?**  Support option 1. As discussed in our paper R4-2111980, we think the periodicity of CSI-RS is quite limited compared to SSB which has reduced the UE implementation complexity. And we agree the Huawei’s analysis on the Rx beam scheduling in R4-2114299. So it should be reasonable to apply the same time restriction to FR2.  **Issue 1-1-2: The applicability condition of CSI-RS measurement window alignment for CSSF requirements?**  Fine with option 1. And we are fine with the applicability condition of CSI-RS time window mentioned in R4-2114300. |
| MTK | **Issue 1-1-1 & Issue 1-1-2:**  We are fine with Option 1 in both issues, but would like to agree both 1-1-1 and 1-1-2 as a package. |
| apple | Issue 1-1-1: ok with option 1  Issue 1-1-2: ok with option 1 |
| Intel | Issue 1-1-1: Fine with option 1  Issue 1-1-2: Fine with option 1 |

### Sub-topic 1-2 UE behavior when the timing offset exceeds the threshold with single FFT assumption

* Proposals
  + Option 1: (CATT, vivo, Huawei)
    - No spec updates are needed
  + Option 2: (Nokia)
    - For intra-frequency measurement, the UE is not required to report the configured CSI-RS resources of a neighbour cell if the symbol level misalignment between serving and the corresponding neighbour cell exceeds the threshold.
    - For inter-frequency measurement, UE can pick up any cell as the reference cell per frequency layer. UE is not required to report the configured CSI-RS resources of a neighbour cell if the symbol level misalignment between the reference cell and the corresponding neighbour cell belonging to the same frequency layer exceeds the threshold.
* Recommended WF
  + *Need more discussion.*

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| **Sub-topic 1-2 UE behavior when the timing offset exceeds the threshold with single FFT assumption** | |
| **Company** | **Comments** |
| CATT | Support option 1. Although we understand the concern on the uncertainty of the reported results when the timing offset exceeds the threshold from NW perspective, we think the measurement should be left to UE implementation as there are not performance requirements when the timing offset exceeds the threshold. Also as other companies mentioned in the meeting, there is no requirement how UE to estimate the timing offset, even if the UE behavior when the timing offset exceeds the threshold is defined, the measurement is still up to UE implementation. |
| MTK | Support Option 1. This should be left to UE implementation. |
| apple | Option 2 makes more sense. However, we are OK with option 1 too. |
| Intel | Prefer option 1. It’s better to left to UE implementation. |

## Companies views’ collection for 1st round

### Open issues

### CRs/TPs comments collection

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

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| R4-2111981 (CATT) | Company A |
| Company B |
|  |
| R4-2112119 (Apple)  (CR on CSSF) | CATT: Can the modification be covered by ‘Note 6: NPCC\_CSIRS=1 if PCC is with either both SSB and CSI-RS based L3 configured or only CSI-RS based L3 measurement configured; otherwise, NPCC\_CSIRS =0.’? |
| Company B |
|  |
| R4-2112396 (MTK)  (CR on 2 windows) | CATT: Pending on issue 1-1-1 |
| MTK: We will not pursue the CR. |
|  |
| R4-2112515 (CMCC)  (CR on applicability) |  |
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|  |
| R4-2112880 (Nokia)  (CR on timing offset impact) | CATT: Pending on sub-topic 1-2 |
| MTK: Do not see the need of this CR |
|  |
| R4-2112882 (Nokia)  (CR on resource periodicity) |  |
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| R4-2112884 (Nokia) | CATT: As intra-frequency CSI-RS measurements are always performed without gap, we think TSSB\_time\_index\_intra with gap and Tidentify\_inter\_with\_index with gap is not needed.  For table 9.10.2.5-3, it was added in RAN4#98e meeting (CR R4-2103633) for the SFN acquisition time for FR1. It seems the sentence was deleted accidentally in last meeting. We have given the correction in CR R4-2111981. |
| MTK: We have concern on this CR. The change to remove SFN is wrong. The SSB index is not sufficient for UE to identify the CSI-RS location in time. One quick example is on the case when the CSI-RS resource periodicity is 20ms or 40ms. In this case, CSI-RS will not come in every radio frame. And UE has to get the SFN to identify the right radio frame for measurement. |
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| R4-2114300 (Huawei)  (CR on measurement window) |  |
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## Summary for 1st round

### Open issues

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

|  |  |
| --- | --- |
| **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)

# Recommendations for Tdocs

## 1st round

**New tdocs**

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

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-210xxxx | CR on … | XXX | Agreeable, Revised, Merged, Postponed, Not Pursued |  |
| R4-2111981 | Draft CR on CSI-RS based measurement requirements | CATT |  |  |
| R4-2112119 | Draft CR on CSSF for CSI-RS L3 RRM R16 | Apple |  |  |
| R4-2112396 | CR on 2 windows for CSI-RS L3 measurement R16 | MediaTek inc. |  |  |
| R4-2112515 | Draft CR on requirements applicability for CSI-RS based L3 measurement | CMCC |  |  |
| R4-2112880 | 38.133 CR on the timing offset impact to CSI-RS based measurement | Nokia, Nokia Shanghai Bell |  |  |
| R4-2112882 | 38.133 CR on the CSI-RS resource periodicity | Nokia, Nokia Shanghai Bell |  |  |
| R4-2112884 | 38.133 CR on the CSI-RS based measurement requirements | Nokia, Nokia Shanghai Bell |  |  |
| R4-2114300 | CR on CSI-RS measurement window | Huawei, HiSilicon |  |  |

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** |
| R4-210xxxx | 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 |  |
|  |  |  |  |  |

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** |
| CATT | Qiuge Guo | guoqiuge@catt.cn |
| Apple | Yang Tang | yang.tang@apple.com |
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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)