**3GPP TSG-RAN WG4 Meeting #102-e draftR4-2207434**

**Electronic Meeting, 21st Feb 2022 – 3rd Mar 2022**

**Agenda item:** 10.9.4.3

**Source:** Moderator (Nokia, Nokia Shanghai Bell)

**Title:** Email discussion summary for [102-e][321] NR\_HST\_FR2\_Demod\_Part2

**Document for:** Information

# Introduction

*Briefly introduce background, the scope of this email discussion (e.g. list of treated agenda items) and provide some guidelines for email discussion if necessary.*

*List of candidate target of email discussion for 1st round and 2nd round*

* 1st round: TBA
* 2nd round: TBA

## Scope

This T-doc will be used to guide and summarize the email discussion for the topic of Rel-17 NR FR2 HST BS Demod requirements (AI 10.9.4.3), with the email thread identifier “[102-e][321] NR\_HST\_FR2\_Demod\_Part2”.

The scope of this email discussion are the Rel-17 NR FR2 HST BS Demod requirements, and in particular the agenda items:

10.9.4.3 BS demodulation requirements

10.9.4.3.1 PUSCH requirements

10.9.4.3.2 PUSCH with UL timing adjustment requirements

10.9.4.3.3 PRACH requirements

Priority topics are marked directly in the open issues’ summaries.

## Notes on email discussions

From the previous meeting arrangements:

|  |
| --- |
| * Delegates are strongly encouraged to provide comments/concerns asap
	+ Silence within a reasonable timeframe means no objection
* It is strongly encouraged that each company/delegate consolidate their comments/views and send them out in one email for each email thread
* Length of file names shall be reduced, e.g.
	+ At the beginning of first round, moderators share / ftp / tsg\_ran / WG4\_Radio / TSGR4\_98\_e / Inbox / Drafts / [98e][101] NR\_NewRAT\_SysParameters\Summary\_101\_1st round\_v01.docx
	+ After update by company A: Summary\_101\_1st round\_v02\_companyA
	+ After update by company B: Summary\_101\_1st round\_v03\_companyA\_companyB
	+ After update by company C: Summary\_101\_1st round\_v04\_companyB\_companyC
 |

# Topic #1: General

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

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-20xxxxx | Company A | Proposal 1:Observation 1: |
| R4-2205755 | Huawei, HiSilicon | Title: Draft CR on HST FR2 BS applicability rule (38.141-2)Moderator: draftCR |
| R4-2203542 | Samsung | Title: Simulation results summary for Rel-17 FR2 HST BS demodModerator: Simulation collection spreadsheet. Tdoc is only reserved and will be uploaded at the end of the meeting. |
| R4-2205034 | Ericsson | Title: On the OTA test setup CR for 38.141-2**Observation 1**: No need for any draft CR for annex E of 38.131-2. |

## Open issues summary

*Before e-Meeting, moderators shall summarize list of open issues, candidate options and possible WF (if applicable) based on companies’ contributions.*

*Interested companies are expected to add their views directly under the respective issues in a dialogue-like form, i.e., identical to how the chair would record views during a f2f meeting.*

*Please add further table rows as required and do not change previous comments of your company or other companies. Answering to questions from other companies is encouraged.*

### Sub-topic 1-1: CR drafting administration

*Sub-topic description:*

The CR split was agreed previously (see below for reminder).

This sub-topic will handle all questions and requests related to draftCR and bigCR administration.

|  |  |  |
| --- | --- | --- |
| **Section number** | **Section title** | **Responsible company** |
| **TS 38.104** |
|  | *Big CR* | Samsung |
| 11 | Radiated performance requirements |
| 11.2 | Performance requirements for PUSCH |
| 11.2.2 | Requirements for BS type 2-O |
| *11.2.2.x* | *Requirements for PUSCH for high speed train* | *Intel* |
| *11.2.2.y* | *Requirements for UL timing adjustment* | *CATT* |
| 11.4 | Performance requirements for PRACH |
| 11.4.2 | Requirements for BS type 2-O |
| 11.4.2.2 | PRACH detection requirements |
| *11.4.2.2.x* | *Minimum requirements for high speed train* | *Huawei* |
| *Annex A* | *Reference measurement channels* | *Intel* |
| *Annex G.3* | *High speed train condition* | *Nokia* |
| *Annex G.4* | *Moving propagation conditions* | *CATT* |
| **TS 38.141-2** |
|  | *Big CR*  | *Nokia* |
| *4.6* | *Manufacturer's declarations* | *Samsung, Nokia* |
| 8 | Radiated performance requirements |
| 8.1.2 | Applicability rule |
| *8.1.2.4* | *Applicability of PUSCH for high speed train performance requirements* | *Huawei* |
| 8.2 | OTA performance requirements for PUSCH |
| *8.2.4* | *Performance requirements for PUSCH for high speed train* | *Ericsson, Samsung* |
| *8.2.5* | *Performance requirements for UL timing adjustment* | *CATT* |
| 8.4 | OTA performance requirements for PRACH |
| 8.4.1 | PRACH false alarm probability and missed detection |
| *8.4.1.6* | *Test requirement for high speed train* | *Huawei* |
| *Annex A* | *Reference measurement channels* | *Intel* |
| *Annex E* | *OTA measurement system set-up* | *Ericsson* |
| *Annex J.3*  | *High speed train condition* | *Nokia* |
| *Annex J.4* | *Moving propagation conditions* | *CATT* |

*Open issues and candidate options before e-meeting:*

**Issue 1-1-1: BigCR reservation**

* Proposals
	+ Option 1 (Moderator): No contributor has reserved tdoc for bigCRs.
	Moderator to request tdoc number for email approval at the end of the first round for 38.104 bigCR (Samsung) and 38.141-2 bigCR (Nokia).
	+ Other options not precluded
* Recommended WF
	+ Option 1.

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX |  |
| Intel | Support the recommended WF. |
| Samsung | Ok with recommended WF |
| Ericsson | Assuming we aim to endorse draft CRs and capture in a draft CR this meeting then we agree. If the intention is just to take comments to the draft CRs then it would not be needed.There are some missing CRs and more simulation results needed, so anyhow we will need to finalize in May. If the moderator prefers to get big CRs with what we have now though, the WF is fine. |
| Nokia | Many of the draft CRs are still pending on the agreement on the selection of MCS(s) for the PUSCH requirements. Therefore, the scope of endorsed draft CRs might be limited at this meeting.However, we are fine to reserve bigCR in case some of draftCRs are endorced. |

### Sub-topic 1-2: Other

*Sub-topic description:*

*In this sub-topic companies are invited to bring issues to the attention of the group, which have not been captured in the previous sub-topics.*

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX |  |

## 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**  |
| **Sub-topic#1** | *Tentative agreements:**Candidate options:**Recommendations for 2nd round:* |
| **Sub-topic 1-1** | **Sub-topic 1-1: CR drafting administration**Issue 1-1-1: BigCR reservation*Tentative agreements:*None.*Candidate options:*None.*Recommendations for 2nd round:*PUSCH: Since MCS/SNR remain undecided this meeting it seems to make little sense to include PUSCH in specification.UL TA: No draftCRs were submitted. Please consider bringing them next meeting,PRACH: DraftCRs are available, but need some revisions.Moderator proposes to postpone PUSCH draftCRs and try to endorse PRACH draftCRs this meeting.Following chair guidance (concerning another email thread), it is possible to include draftCRs that have been endorsed in prior meetings in a bigCR of future meetings.Hence moderator recommends to not allocate bigCRs this meeting, and include any endorsed draftCRs from this meeting, in the bigCRs of the next meeting.“Hello All If no further update on FRC to 38.104, we can simplify implement to big CR with the endorsed CR in previous meeting, no need to resubmit this meeting.In big CR cover sheet, we shall list all the implemented draft CRs from this meeting and previous meetings if any.BR,Haijie” |
| **Sub-topic 1-2** | **Sub-topic 1-2: Other** No comments |

*Recommendations on WF/LS assignment*

|  |  |  |
| --- | --- | --- |
|  | **WF/LS t-doc Title**  | **Assigned Company,****WF or LS lead** |
| #1 |  |  |
| None |  |  |

### 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”* |
| None |  |

## Discussion on 2nd round

No comments have been received in response to the moderator proposed WF in the 1st round summary.
As such there are no open issues here and the CR treatment will proceed as outlined in 1st round.

### Sub-topic 1-2: Other

*Sub-topic description:*

*In this sub-topic companies are invited to bring issues to the attention of the group, which have not been captured in the previous sub-topics.*

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX |  |

## Summary on 2nd round (if applicable)

*Moderator tries to summarize discussion status for 2nd round and provided recommendation on CRs/TPs/WFs/LSs Status update suggestion*

|  |  |
| --- | --- |
| **CR/TP/LS/WF number** | **T-doc Status update recommendation**  |
| XXX | *Based on 2nd round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |
|  |  |

# Topic #2: PUSCH requirements

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

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-20xxxxx | Company A | Title: Proposal 1:Observation 1: |
| [**R4-2203545**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2203545.zip) | Samsung | Title: Discussion and simulation results of PUSCH requirement for Rel-17 FR2 HSTTest Applicability rule for RS configuration**Observation 1**: The overhead of 1DMRS +PTRS (L=1, K=2) configuration is the smallest compared with other RS configuration schemes.**Observation 2**: Similar performance can be achieved for 2 DMRS configuration and 3 DMRS configuration.**Observation 3**: Existing Rel-15 test applicability rule and BS manufacture with different RS configuration cannot guarantee Rel-17 FR2 HST BS test with more than 2 DMRS configuration.**Observation 4**: The test is clearly defined non-HST scenario in Rel-15, in case both options (i.e., pos 0 and pos 1) are declared to be supported, the tests shall be done for pos 1**Proposal 1: FR2 HST PUSCH requirement test shall apply only for the additional DM-RS position declared to be supported. If more than one DMRS configuration is declared to be supported, the test shall be done for the minimum number of DMRS supported****Proposal 2: RAN4 applies the following manufacturer on HST FR2 DM-RS supported**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **D.1XX** | **PUSCH additional DM-RS positions** | **Declaration of the supported additional DM-RS position(s) for FR2 high speed train scenario, i.e., {pos0},{pos1},{pos2},{pos0,pos1}, {pos0 pos1}, {pos0,pos2}, {pos1,pos2} and all** | **n/a** | **n/a** | **x** |

MCS/Simulation results**Observation 5**: Small performance gap between two kinds of FOC implementation methods for MCS 16 and MCS 17, around 2 or 3 dB difference between post-FFT and pre-FFT FOC methods for MCS 16 and MCS17.Observation 6: Around 7dB difference between post-FFT and pre-FFT FOC methods for MCS 20**Proposal 2: RAN4 apply only MCS 16 for PUSCH requirement with FR2 HST** |
| [**R4-2203971**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2203971.zip) | CATT | Title: Discussion on PUSCH demodulation requirements for FR2 HSTTest applicability**Proposal 1: To adopt option 2 for test applicability.**Manufacturer declaration**Proposal 2: To adopt the following manufacturer declaration for different additional DM-RS position for FR2 HST.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **D.x** | **Additional DM-RS position for FR2 high speed train** | **Declaration of supported additional DM-RS position for FR2 high speed train scenario for PUSCH and UL timing adjustment, i.e., pos0, pos1, pos2.** | **n/a** | **n/a** | **x** |

MCS**Proposal 3: To adopt Option 1(only MCS 20), or Option 4(only MCS16).** |
| [**R4-2203972**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2203972.zip) | CATT | Title: Simulation results for PUSCH demodulation requirements for FR2 HSTModerator: Only simulation results. |
| [**R4-2204389**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2204389.zip) | Intel Corporation | Title: DraftCR to TS 38.104: FRC for HST FR2 PUSCH performance requirementsModerator: draftCR |
| [**R4-2204390**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2204390.zip) | Intel Corporation | Title: DraftCR to TS 38.104: HST FR2 PUSCH performance requirementsModerator: draftCR |
| [**R4-2204391**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2204391.zip) | Intel Corporation | Title: DraftCR to TS 38.141-2: FRC for HST FR2 PUSCH performance requirementsModerator: draftCR |
| [**R4-2204392**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2204392.zip) | Intel Corporation | Title: HST FR2 PUSCH simulation resultsModerator: Simulation results**Observation #1**: There is almost the same demodulation performance at 70% of max throughput with HST bi-directional and static channel model. **Observation #2**: The performance in scenarios with 50MHz CBW is worse compared to the performance in scenarios with 20MHz CBW. |
| [**R4-2205023**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2205023.zip) | Ericsson | Title: HST PUSCH requirements**Proposal 1: Adopt MCS20 for the PUSCH demodulation requirement** |
| [**R4-2205033**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2205033.zip) | Ericsson | Title: Draft CR on introduction of FR2 HST test procedure for PUSCHModerator: draftCR |
| [**R4-2205758**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2205758.zip) | Huawei, HiSilicon | Title: Discussion on PUSCH demodulation requirements for FR2 HSTTest applicability**Proposal 1: If more than one DMRS configuration is declared to be supported, a pass with either of the possibilities is sufficient to demonstrate compliance to the core requirement.****Proposal 2: Add a note to the performance requirements as following to ensure that only one case is tested.****- Either pos 1, pos 2 or pos 3 may be used for the test FRC based on BS manufacturer declaration. A pass with either of these possibilities is sufficient to demonstrate compliance to the core requirement.**Manufacturer declaration on HST FR2 DM-RS support – PUSCH**Proposal 3: The wording of manufacturer declaration can be****- “Declaration of supported additional DM-RS position for FR2 high speed train scenario for PUSCH and UL timing adjustment, i.e., pos0, pos1, pos2.”****MCS****Proposal 4: Only one MCS should be selected, such as MCS20.**Moderator: There was significant mismatch between observations/proposal in *Discussion* and *Proposal* summary sections of the tdoc. Moderator has tried to integrate both, even when incompatible. Please check above result carefully.To moderator: Sorry for the confusing. After double checking, we update our proposal with removing the version in our proposal summary that is for pervious meeting. |
| [**R4-2205965**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2205965.zip) | Nokia, Nokia Shanghai Bell | Title: On HST FR2 PUSCH Demodulation RequirementsOn test applicability rules and manufacturer declarations**Proposal 1: RAN 4 to describe manufacture declaration on HST FR2 DM-RS support as follows:“Declaration of the supported additional DM-RS position(s) for HST FR2 scenario, i.e., pos0, pos1, pos2, or any combinations of those.”****Observation 1**: If the test has passed with lower DM-RS density, then we can expect that it will be passed with higher density as well. However, passing of the test with high DM-RS density may not guaranty that the lower DM-RS density is sufficient.**Proposal 2: RAN4 to base test applicability on Option 2, i.e., if more than one DM-RS configuration is declared to be supported, the test shall be done for the minimum number of DM-RS supported.**On MCS requirements selection**Observation 2**: Based on our results, there is no meaningful difference in PUSCH performance between the agreed HST FR2 channel model with a Doppler profile and simpler model with fixed Doppler offset.**Proposal 3: Ideal and impairment results reported in Table 1 and Table 3 can be used for the simulation results alignment.****Proposal 4: Use MCS 20 only as a baseline. Change to lower MCS if SNR after requirement derivation is larger than 20dB or if there is a large span in the alignment results.** |

## Open issues summary

*Before e-Meeting, moderators shall summarize list of open issues, candidate options and possible WF (if applicable) based on companies’ contributions.*

*Interested companies are expected to add their views directly under the respective issues in a dialogue-like form, i.e., identical to how the chair would record views during a f2f meeting.*

*Please add further table rows as required and do not change previous comments of your company or other companies. Answering to questions from other companies is encouraged.*

### Sub-topic 2-1: Test applicability rules and manufacturer declarations

*Sub-topic description:*

*Open issues and candidate options before e-meeting:*

**Issue 2-1-1: Test applicability**

* Proposals
	+ Option 1 (Huawei): If more than one DMRS configuration is declared to be supported, a pass with either of the possibilities is sufficient to demonstrate compliance to the core requirement.
	Add a note to the performance requirements as following to ensure that only one case is tested.
		- Either pos 1, pos 2 or pos 3 may be used for the test FRC based on BS manufacturer declaration. A pass with either of these possibilities is sufficient to demonstrate compliance to the core requirement.
	+ Option 2 (Samsung, CATT, Nokia): FR2 HST PUSCH requirement test shall apply only for the additional DM-RS position declared to be supported.
	If more than one DMRS configuration is declared to be supported, the test shall be done for the minimum number of DMRS supported.
	+ Other options not precluded
* Recommended WF
	+ Option 2 has majority. Select option 2.

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX |  |
| Intel | We prefer to have a strict rule which test configuration should be used. If BS declares several additional DMRS configurations it should not be a problem to pass the test with the less dense one. Support Option 2. |
| Samsung | Support option 2, Same with Rel-15, a clear rule should be considered. Since ran4 is to define minimum requirement, it is necessary to guarantee the basics requirement with minimum number of DMRS |
| Huawei | To move forward, we can compromise to Option 2. |
| Ericsson | We prefer option 2. There will already be one declaration of which DM-RS the BS supports. It would not make sense to then have a second declaration of which of the supported DM-RS are tested. If they are declared as supported then anyhow all of the DM-RS should be able to pass, so a simple applicability rule makes sense and proposal 2 selects the highest throughput case. |
| Nokia | If the test is passed with lower density of RM-RS, then one can expect that it passes with higher DM-RS density as well. The opposite may not be true, i.e., if the test passed with denser DM-RS then it may not be guaranteed that it can be passed with lower DM-RS density.Thus, we see Option 2 to be more logical. |
| CATT | Support option 2 to test the minimum number of DMRS. Testing Pos0 can guarantee the baseband processing and confirm other configurations will pass. |

**Issue 2-1-2: Wording of manufacturer declaration on HST FR2 DM-RS support**

* Prior agreements
	+ [R4-2203006]:
		- Manufacturer declaration on HST FR2 DM-RS support – UL TA
			* Share the same manufacturer declaration with PUSCH.
* Proposals
	+ Option 1 (Samsung): To adopt the following manufacturer declaration for different additional DM-RS position support for FR2 HST.
		- PUSCH additional DM-RS positions:
		Declaration of the supported additional DM-RS position(s) for FR2 high speed train scenario, i.e., {pos0},{pos1},{pos2},{pos0,pos1}, {pos0 pos1}, {pos0,pos2}, {pos1,pos2} and all.
	+ Option 2 (CATT, Huawei): To adopt the following manufacturer declaration for different additional DM-RS position support for FR2 HST.
		- Additional DM-RS position for FR2 high speed train:
		Declaration of supported additional DM-RS position for FR2 high speed train scenario for PUSCH and UL timing adjustment, i.e., pos0, pos1, pos2.
	+ Option 3 (Nokia): To adopt the following manufacturer declaration for different additional DM-RS position support for FR2 HST:
		- Declaration of the supported additional DM-RS position(s) for HST FR2 scenario, i.e., pos0, pos1, pos2, or any combinations of those.
	+ Option 4 (Moderator) To adopt the following manufacturer declaration for different additional DM-RS position support for FR2 HST.
		- Additional DM-RS position for FR2 high speed train:
		Declaration of supported additional DM-RS position(s) for FR2 high speed train scenario for PUSCH and UL timing adjustment, i.e., pos0, pos1, pos2, or any combination.
	+ Other options not precluded
* Recommended WF
	+ All proposals seem to be aligned in their technical intent.
	Option 2 has majority.
	+ Agree with option 2 or moderator proposed option 4, which aims to merge the “position**(s)**” and “**any combination**” explicit highlighting from option 1 and 3 into option 2.

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX |  |
| Intel | Support proposed by Moderator Option 4. If BS supports several DMRS configurations it should be declared. |
| Samsung | Support proposed by Moderator option 4 |
| Huawei | We are fine with Option 4. |
| Ericsson | Option 4 is fine for us |
| Nokia | Support Option 4 proposed by the Moderator. |
| CATT | OK with option 4 proposed by moderator. |

### Sub-topic 2-2: MCS selection

*Sub-topic description:*

*Open issues and candidate options before e-meeting:*

**Issue 2-2-1: MCS**

* Proposals
	+ Option 1 (CATT, Ericsson, Huawei, Nokia): Only MCS 20.
	+ Option 2 (Samsung, CATT): Only MCS 16.
	+ Option 3 (Nokia, Intel, Huawei, Ericsson, CATT): Use MCS 20 only as a baseline. Change to lower MCS if SNR after requirement derivation is larger than 20Db or if there is a large span in the alignment results.
	+ Other options not precluded
* Recommended WF
	+ Option 3 could be a compromise, but define what constitutes a large span.
		- Moderator proposal: Use same span as ideal span threshold for requirement derivation [R4-1904713] [R4-19004714], i.e., 2Db, or extended 2.5Db.

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX |  |
| Intel | MCS 20 is more reasonable assumption for backhaul connection than lower MCS indices. However, with lower MCS indices we have smaller span. Generally, we are fine with the suggested WF. Same time even 2.5 Db span might not be enough.  |
| Samsung | Based on existing result summary in R4-2203542, we can have serval observationsObservation1: The performance gap with MCS16 among companies is the small one for both Pre-FFT and Post-FFT FOCObservation2: The performance gap is increasing based MCS increasing for both Pre-FFT and Post-FFT FOC among companies, large gap for MCS20 up to 4.5dB, even removing our results.Observation3: Minor performance gap with MCS 16 between Post-FFT FOC and Pre-FFT FOC for each companies, In general, with high MCS, due to high Doppler frequency, the performance will have large degradation due to ICI with Post-FFT FOC operation. Without ICI compensation, it will result in large performance gap, specifically for MCS20, this maybe the reason of performance gap with hihgh MCS among companies.As agreed, the receiver assumption is based on Post-FFT FOC, and up to BS implementation. While whether ICI compensation will be considered is also up to BS implementation. With ICI compensation, the performance can be improved. Since RAN4 is to define minimum requirement, based on existing results, MCS 16 can guarteen the basic baseband processing for Doppler tracking either post-FFT FOC and pre-FFT FOC methods . Meanwhile, MCS 16 have already applied for FR1 HST requirement.In summary, we think MCS 16 is more reasonable for requirement with considering minor gap among companies, and minor gap for different FOC implementation.Regarding the gap for ideal span, As shown in the ideal results under fixed Doppler value +AWGN, we still see large 2dB performance gap is existed with Post-FFT FOC, Therefore, in the High speed channel model as Bi-directional scenario, we think the performance gap should be as least [2.5dB], pending on alignment results. At least based on current results, it seems that [2.5dB] is not enough |
| Huawei | We are fine with the recommended WF. Considering there is large span, we are OK to select MCS16 and extend the maximum tolerable ideal span to the 2.5dB. If there is still large span, the procedure defined in R4-1904713 should be performed. |
| Ericsson | Since the scenario is backhaul and the SNR is always high, testing the highest MCS that is testable is best. We do not see algorithmic problems to achieve MCS20. We are OK with the moderator proposal though to check the results and procedure for deciding the requirement, and then whether the span is exceeded. |
| Nokia | The scenario of HST FR2 is very different from HST FR1 where regular UEs access the network. Therefore, we think that MCS16 might not be that typical for SHT FR2 deployments, and, hence, higher MCS should be selected for testing.If we follow the SNR derivation procedure from R4-1904713, the MCS20 can be already agreed since there are always at least three companies with the results well aligned, i.e. within 2dB span.However, some of scenarios still demonstrate a lack of alignment after one outlier is excluded, for example 120kHz, 50MHz, DMRS 1+0, **MCS16** has a span of 3.28dB even after removing one of the outlier and only removing two of outliers brings the span within 2dB.In general, MCS20 demonstrates a bit higher Span across all the cases. Whereases, MCS19 requires exclusion of only one outlier in most cases (except for 50MHz cases with DMRS 1+0, DMRS 1+1 where span for MCS16 is high as well). Hence, MCS19 could be an alternative way forward, if MCS20 cannot be agreed. Our preference is still Option 1. |
| CATT | We are OK with option 1 and option 2. Also the recommended WF is acceptable. |

### Sub-topic 2-3: Requirement selection

*Sub-topic description:*

In the last meeting, a very large span was still observed in PUSCH simulation results; especially at higher MCS. It was unclear if all this gap is due to post-FFT vs. pre-FFT implementation, or due to other influences.
To improve alignment, interested companies were invited to voluntarily bring results for AWGN + fixed maximum Doppler offset of 19458 Hz (without bi-directional propagation channel), at least for the test case {Post-FFT/[Pre-FFT]; Type B, 10 Symbols, 120kHz/200MHz; MCS20; DM-RS 1+1}. The results are for alignment only and not intended for deriving the requirement.

The following results were shared [dB SNR@70%TPUT]:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Configuration | FOC | HuaweiR4-2205758 | NokiaR4-2205965 | IntelR4-2204392 | EricssonR4-2205023 |  |
| PUSCH Type B, 10 Symbols, 120kHz/200MHz; MCS20; DM-RS 1+1AWGN + fixed maximum Doppler offset of 19458 Hz | **Post-FFT** | 11.25 | 9.96 | 12.0 | 11.2 |  |
| **Pre-FFT** | 9.33 | 9.26 |  | 9.4 |  |
|  |  |  |  |  |  |

*Open issues and candidate options before e-meeting:*

**Issue 2-3-1: Requirement selection**

* Prior agreements
	+ [R4-2203006]
		- MCS selection: Receiver baseline assumption for simulation
			* Assume a receiver with post FFT FOC.
* Proposals
	+ Option 1 (Moderator, Nokia, Samsung(?), Ericsson): Apply standard requirement selection to (post-FFT) results with outlier selection, as in Rel-15 [R4-1904713] [R4-19004714]. Choose ideal result alignment threshold as 2.5dB, and impairment threshold as 4dB.
	+ Other options not precluded.
* Recommended WF
	+ For the static FO test, the contributing companies are aligned within 2.29dB in post-FFT, and within 0.14 dB for pre-FFT. Post-FFT is worse in terms of performance than pre-FFT.
	+ All companies are very much invited to update their simulation results in the simulation summary in the draft folder, so we can evaluate if large misalignment is still present.
	+ Discuss in first round.

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX |  |
| Intel | Simulation results summary collect results for pre-FFT FOC. However, we have the following agreement in R4-2203006: “Assume a receiver with post FFT FOC”. Therefore, summary should be updated.  |
| Samsung | We can update the simulation result summary to remove the pre-FFT FOC in the final version Both Pre-FFT FOC and Post-FFT FOC are included, It is just for information to choose MCS for requirement.As shown in the ideal results under fixed Doppler value +AWGN, we still see large 2dB performance gap is existed with Post-FFT FOC, Therefore, in the High speed channel model as Bi-directional scenario, we think the performance gap should be as least [2.5dB], pending on alignment results. At least based on current results, it seems that [2.5dB] is not enough. |
| Ericsson | Agree moderator proposal 1; we can check the remaining span when results are available. |
| Nokia | As we commented in the Issue 2-2. It is should be possible to agree on MCS20 if we follow standard requirement selection, i.e., there are always at least three companies aligned even within 2.0dB.Therefore, we believe that the standard requirement selection procedure can be followed.Agree we the Moderator’s Option 1. |

### Sub-topic 2-4: Other

*Sub-topic description:*

*In this sub-topic companies are invited to bring issues to the attention of the group, which have not been captured in the previous sub-topics.*

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX |  |

### 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.*

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| XXX | Title, Source |
| Company A |
| Company B |
|  |
| R4-2204389 | DraftCR to TS 38.104: FRC for HST FR2 PUSCH performance requirements, Intel |
| Nokia:Our preference would be to define FRCs after the modulation/MCS for the requirements is decided. For the moment, there is even no agreement whether requirements are defined for one MCS only. Additionally, total number of bits per slot can be decided only after the modulation is defined. |
| **Moderator: Please continue discussion in second round discussion section!** |
|  |
| R4-2204390 | DraftCR to TS 38.104: HST FR2 PUSCH performance requirements, Intel |
| Nokia:Similar comment as above.Additionally, at RAN#101-e it was agreed:* Define requirement with 1 DMRS + PT\_RS (L=1, K=2) configuration
	+ Define FRC for 1 DMRS + PT\_RS (L=1, K=2)
* Define requirement based on the simulation results with 2 DMRS+ PT\_RS (L=1, K=2) configuration, but the final requirements are applicable for both 2 DMRS+ PT\_RS (L=1, K=2) and 3 DMRS + PT\_RS (L=1, K=2)
	+ Define FRC for 2 DMRS + PT\_RS (L=1, K=2)
	+ Define FRC for 3 DMRS + PT\_RS (L=1, K=2)

Therefore, only two sets of requirements shall be defined. |
| **Moderator: Please continue discussion in second round discussion section!** |
|  |
| R4-2204391 | DraftCR to TS 38.141-2: FRC for HST FR2 PUSCH performance requirements, Intel |
| Nokia:Same comment as for R4-2204389. |
| **Moderator: Please continue discussion in second round discussion section!** |
|  |
| R4-2205033 | Draft CR on introduction of FR2 HST test procedure for PUSCH, Ericsson |
| Nokia:We expect that requirements with only one MCS will be agreed, but there is no such agreement yet. Hence, it is reasonable to wait for the agreement on MCS, first.Additionally, DM-RS position syntax should be aligned across the draft CR: pos1 vs. Pos1. |
| **Moderator: Please continue discussion in second round discussion section!** |
|  |

## 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**  |
| **Sub-topic#1** | *Tentative agreements:**Candidate options:**Recommendations for 2nd round:* |
| **Sub-topic 2-1** | **Sub-topic 2-1: Test applicability rules and manufacturer declarations**Issue 2-1-1: Test applicability*Tentative agreements:*FR2 HST PUSCH requirement test shall apply only for the additional DM-RS position declared to be supported. If more than one DMRS configuration is declared to be supported, the test shall be done for the minimum number of DMRS supported.*Candidate options:*None*Recommendations for 2nd round:*Tentative agreement is agreeable.Issue 2-1-2: Wording of manufacturer declaration on HST FR2 DM-RS support*Tentative agreements:*Adopt the following manufacturer declaration for different additional DM-RS position support for FR2 HST.Additional DM-RS position for FR2 high speed train: Declaration of supported additional DM-RS position(s) for FR2 high speed train scenario for PUSCH and UL timing adjustment, i.e., pos0, pos1, pos2, or any combination.*Candidate options:*None*Recommendations for 2nd round:*Tentative agreement is agreeable. |
| **Sub-topic 2-2** | **Sub-topic 2-2: MCS selection** Issue 2-2-1: MCS *Tentative agreements:*None.*Candidate options:** Option 1: Only MCS 20.
* Option 2: Only MCS 16.
* Option 3: Use MCS 20 only as a baseline. Change to lower MCS if SNR after requirement derivation is larger than 20Db or if there is a span >2.5dB in the alignment results.
* Option 4: Only MCS 19.

*Recommendations for 2nd round:*Propose to discuss in GtW.Can option 4 be a compromise? |
| **Sub-topic 2-3** | **Sub-topic 2-3: Requirement selection** Issue 2-3-1: Requirement selection *Tentative agreements:*None.*Candidate options:** Option 1: Apply standard requirement selection to (post-FFT) results with outlier selection, as in Rel-15 [R4-1904713] [R4-19004714]. Choose ideal result alignment threshold as 2.5dB, and impairment threshold as 4dB.
* Option 2: Other options not precluded.

*Recommendations for 2nd round:*Propose to discuss in GtW.Option 1 looks like a potential agreement. No direct negative comments received in 1st round. |
| **Sub-topic 2-4** | **Sub-topic 2-4: Other**No comments |

*Recommendations on WF/LS assignment*

|  |  |  |
| --- | --- | --- |
|  | **WF/LS t-doc Title**  | **Assigned Company,****WF or LS lead** |
| #1 |  |  |
| #1 | WF on BS demodulation requirement for FR2 HST | Nokia, Nokia Shanghai Bell |

### 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”* |
| R4-2204389 | DraftCR to TS 38.104: FRC for HST FR2 PUSCH performance requirements, IntelModerator: FRCs cannot be defined before MCS decided. Propose to postpone. |
| R4-2204390 | DraftCR to TS 38.104: HST FR2 PUSCH performance requirements, IntelModerator: Please check the received comments and respond. Since MCS/SNR remain undecided this meeting it seems to make little sense to include PUSCH in specification. Propose to postpone. |
| R4-2204391 | DraftCR to TS 38.141-2: FRC for HST FR2 PUSCH performance requirements, IntelModerator: FRCs cannot be defined before MCS decided. Propose to postpone. |
| R4-2205033 | Draft CR on introduction of FR2 HST test procedure for PUSCH, EricssonModerator: Please check the received comments. Since MCS/SNR remain undecided this meeting it seems to make little sense to include PUSCH in specification. Propose to postpone. |

## Discussion on 2nd round

All open issues have been resolved in 1st round summary and first GtW.
The agreements are captured in the corresponding WF. Please verify and discuss (if necessary) based on draft WF.

Please continue the draftCR discussion in below section 2.4.2 to further align the PUSCH CR content.

### Sub-topic 2-4: Other

*Sub-topic description:*

*In this sub-topic companies are invited to bring issues to the attention of the group, which have not been captured in the previous sub-topics.*

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX |  |

### 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.*

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| R4-2204389 | DraftCR to TS 38.104: FRC for HST FR2 PUSCH performance requirements, Intel |
| Nokia:Our preference would be to define FRCs after the modulation/MCS for the requirements is decided. For the moment, there is even no agreement whether requirements are defined for one MCS only. Additionally, total number of bits per slot can be decided only after the modulation is defined. |
|  |
|  |
| R4-2204390 | DraftCR to TS 38.104: HST FR2 PUSCH performance requirements, Intel |
| Nokia:Similar comment as above.Additionally, at RAN#101-e it was agreed:* Define requirement with 1 DMRS + PT\_RS (L=1, K=2) configuration
	+ Define FRC for 1 DMRS + PT\_RS (L=1, K=2)
* Define requirement based on the simulation results with 2 DMRS+ PT\_RS (L=1, K=2) configuration, but the final requirements are applicable for both 2 DMRS+ PT\_RS (L=1, K=2) and 3 DMRS + PT\_RS (L=1, K=2)
	+ Define FRC for 2 DMRS + PT\_RS (L=1, K=2)
	+ Define FRC for 3 DMRS + PT\_RS (L=1, K=2)

Therefore, only two sets of requirements shall be defined. |
|  |
|  |
| R4-2204391 | DraftCR to TS 38.141-2: FRC for HST FR2 PUSCH performance requirements, Intel |
| Nokia:Same comment as for R4-2204389. |
|  |
|  |
| R4-2205033 | Draft CR on introduction of FR2 HST test procedure for PUSCH, Ericsson |
| Nokia:We expect that requirements with only one MCS will be agreed, but there is no such agreement yet. Hence, it is reasonable to wait for the agreement on MCS, first.Additionally, DM-RS position syntax should be aligned across the draft CR: pos1 vs. Pos1. |
|  |
|  |

## Summary on 2nd round (if applicable)

*Moderator tries to summarize discussion status for 2nd round and provided recommendation on CRs/TPs/WFs/LSs Status update suggestion*

|  |  |
| --- | --- |
| **CR/TP/LS/WF number** | **T-doc Status update recommendation**  |
| XXX | *Based on 2nd round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |
|  |  |

# Topic #3: PUSCH with UL timing adjustment requirements

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

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-20xxxxx | Company A | Title: Proposal 1:Observation 1: |
| [**R4-2203546**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2203546.zip) | Samsung | Title: Simulation results of UL timing adjustment requirement for Rel-17 FR2 HSTModerator: Only simulation results. |
| [**R4-2203973**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2203973.zip) | CATT | Title: Simulation results for UL timing adjustment demodulation requirements for FR2 HSTModerator: Only simulation results. |
| [**R4-2204393**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2204393.zip) | Intel Corporation | Title: HST FR2 UL TA simulation resultsModerator: Only simulation results. |
| [**R4-2205759**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2205759.zip) | Huawei, HiSilicon | Title: Simulation results on PUSCH with UL timing adjustment requirements for FR2 HSTModerator: Only simulation results. |
| [**R4-2205963**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2205963.zip) | Nokia, Nokia Shanghai Bell | Title: HST FR2 PUSCH UL TA Impairment Simulation ResultsModerator: Only simulation results.**Proposal 1: Use the impairment results in the table above for the alignment of PUSCH UL Timing Adjustment demodulation performance requirements.** |

## Open issues summary

*Before e-Meeting, moderators shall summarize list of open issues, candidate options and possible WF (if applicable) based on companies’ contributions.*

*Interested companies are expected to add their views directly under the respective issues in a dialogue-like form, i.e., identical to how the chair would record views during a f2f meeting.*

*Please add further table rows as required and do not change previous comments of your company or other companies. Answering to questions from other companies is encouraged.*

Only simulation tdocs were submitted to this AI.
No open issues were recorded in last meeting’s WF.

No draftCRs were received. Every entity with CR responsibility, is invited to bring draftCRs to the next meeting

### Sub-topic 3-1: Other

*Sub-topic description:*

*In this sub-topic companies are invited to bring issues to the attention of the group, which have not been captured in the previous sub-topics.*

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX |  |

### 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.*

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| XXX | Title, Source |
| Company A |
| Company B |
|  |
| None |  |
|  |
|  |
|  |

## 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**  |
| **Sub-topic#1** | *Tentative agreements:**Candidate options:**Recommendations for 2nd round:* |
| **Sub-topic 3-1** | **Sub-topic 3-2: Others** Moderator: No draftCRs were received for UL TA up to this point. Please consider bringing draftCRs to the next meeting. |

*Recommendations on WF/LS assignment*

|  |  |  |
| --- | --- | --- |
|  | **WF/LS t-doc Title**  | **Assigned Company,****WF or LS lead** |
| #1 |  |  |
| None |  |  |

### 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”* |
| None |  |

## Discussion on 2nd round

No discussion in first round. No comments to the moderator proposed WF. Please use section 3.4.1 to highlight new 2nd round discussions, if required.

### Sub-topic 3-1: Other

*Sub-topic description:*

*In this sub-topic companies are invited to bring issues to the attention of the group, which have not been captured in the previous sub-topics.*

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX |  |

## Summary on 2nd round (if applicable)

*Moderator tries to summarize discussion status for 2nd round and provided recommendation on CRs/TPs/WFs/LSs Status update suggestion*

|  |  |
| --- | --- |
| **CR/TP/LS/WF number** | **T-doc Status update recommendation**  |
| XXX | *Based on 2nd round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |
|  |  |

# Topic #4: PRACH requirements

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

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-20xxxxx | Company A | Title: Proposal 1:Observation 1: |
| [**R4-2203547**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2203547.zip) | Samsung | Title: Simulation results of PRACH requirement for Rel-17 FR2 HSTModerator: Only simulation results. |
| [**R4-2203974**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2203974.zip) | CATT | Title: Simulation results for PRACH demodulation requirements for FR2 HSTModerator: Only simulation results. |
| [**R4-2204394**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2204394.zip) | Intel Corporation | Title: HST FR2 PRACH simulation resultsModerator: Only simulation results. |
| [**R4-2205760**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2205760.zip) | Huawei, HiSilicon | Title: Simulation results on PRACH demodulation requirements for FR2 HSTModerator: Only simulation results. |
| [**R4-2205761**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2205761.zip) | Huawei, HiSilicon | Title: Draft CR on PRACH minimum requirements for high speed train (38.104)Moderator: draftCR |
| [**R4-2205762**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2205762.zip) | Huawei, HiSilicon | Title: Draft CR on PRACH test requirement for high speed train (38.141-2)Moderator: draftCR |
| [**R4-2205964**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_102-e/Docs/R4-2205964.zip) | Nokia, Nokia Shanghai Bell | Title: HST FR2 PRACH Impairment Simulation ResultsModerator: Only simulation results.**Proposal 1: Use the impairment results in the table above for the alignment PRACH requirements.** |

## Open issues summary

*Before e-Meeting, moderators shall summarize list of open issues, candidate options and possible WF (if applicable) based on companies’ contributions.*

*Interested companies are expected to add their views directly under the respective issues in a dialogue-like form, i.e., identical to how the chair would record views during a f2f meeting.*

*Please add further table rows as required and do not change previous comments of your company or other companies. Answering to questions from other companies is encouraged.*

Only simulation tdocs were submitted to this AI.
No open issues were recorded in last meeting’s WF.

Please **check the submitted draftCRs**.

### Sub-topic 4-1: Other

*Sub-topic description:*

*In this sub-topic companies are invited to bring issues to the attention of the group, which have not been captured in the previous sub-topics.*

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX |  |
| Intel | We have a huge span among ideal results. We encouraged companies to double check their results. |
| Samsung | Based on summary including with Nokia’ result for PRACH, it seems large gap is existed, further checking is appreciated

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Samsung | Huawei | Ericsson | Nokia | Intel | CATT | SPAN |
| Ideal | Impairment | Ideal | Impairment | Ideal | Impairment | Ideal | Impairment | Ideal | Impairment | Ideal | Impairment | Ideal | Impairment |
| -12.55 | -10.55 | -14.07 | -11.57 | -12.6 | -10.1 | -6.91 | -3.81 | -13.2 | -10.7 | -12.59 | -10.09 | 7.16 | 7.76 |

 |
| Nokia | We thank Intel for highlighting an error in the simulations results summary. We had an error in our contribution.We have corrected the value in the modified version of the Simulation results summary.Now, the span is within the acceptable limits. |

### 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.*

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| XXX | Title, Source |
| Company A |
| Company B |
|  |
| R4-2205761 | Draft CR on PRACH minimum requirements for high speed train (38.104), Huawei |
| Nokia:PRACH test preables are defined in different tables for FR1 and FR2.Shall the same approach be used for Test preambles for high speed train short formats?We think that yes. Then, a new table Table A.6-7 or Table A.6-x shall be reference.  |
| Moderator: AWGN propagation condition does not have a correlation matrix. Can we remove the text “and correlation matrix” from the table for now?Agree with Nokia, A.6-5 is referenced in “formats are listed in table A.6-5 and”, but this table does not contain preamble settings for 120kHz. Also in HST FR1 we used different preamble appendix tables for normal mode and HST.The appendix A (FRC) is assigned to @INTEL. Could HW and Intel please agree who does the extension to appendix A.6, how to do it (one vs. two tables), and then select the correct reference in this draftCR?The PRACH result seem to be stable now, so can the TBD be replaced? |
| **Moderator: Please continue discussion in second round discussion section!** |
| R4-2205762 | Draft CR on PRACH test requirement for high speed train (38.141-2), Huawei |
| Moderator: AWGN propagation condition does not have a correlation matrix. Can we remove the text “and correlation matrix” from the table for now?The PRACH result seem to be stable now, so can the TBD be replaced? |
| **Moderator: Please continue discussion in second round discussion section!** |
|  |

## 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**  |
| **Sub-topic#1** | *Tentative agreements:**Candidate options:**Recommendations for 2nd round:* |
| **Sub-topic 4-1** | **Sub-topic 4-1: Other** A mistake in the PRACH simulation results was discovered and fixed. |

*Recommendations on WF/LS assignment*

|  |  |  |
| --- | --- | --- |
|  | **WF/LS t-doc Title**  | **Assigned Company,****WF or LS lead** |
| #1 |  |  |
| None |  |  |

### 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”* |
| R4-2205761 | Draft CR on PRACH minimum requirements for high speed train (38.104), HuaweiModerator: Please check comments received and respond/revise. The PRACH SNR results seem complete and stable enough to be added to draftCR. Proposed to be revised, with the goal of being endorsed in 2nd round. |
| R4-2205762 | Draft CR on PRACH test requirement for high speed train (38.141-2), HuaweiModerator: Please check comments received and respond/revise. The PRACH SNR results seem complete and stable enough to be added to draftCR. Proposed to be revised, with the goal of being endorsed in 2nd round. |

## Discussion on 2nd round

Please continue the draftCR discussion in below section 4.4.2 to further align the PRACH CR content.

### Sub-topic 4-1: Other

*Sub-topic description:*

*In this sub-topic companies are invited to bring issues to the attention of the group, which have not been captured in the previous sub-topics.*

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX |  |

### 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.*

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| R4-2205761 | Draft CR on PRACH minimum requirements for high speed train (38.104), Huawei |
| Nokia:PRACH test preables are defined in different tables for FR1 and FR2.Shall the same approach be used for Test preambles for high speed train short formats?We think that yes. Then, a new table Table A.6-7 or Table A.6-x shall be reference.  |
| Moderator: AWGN propagation condition does not have a correlation matrix. Can we remove the text “and correlation matrix” from the table for now?Agree with Nokia, A.6-5 is referenced in “formats are listed in table A.6-5 and”, but this table does not contain preamble settings for 120kHz. Also in HST FR1 we used different preamble appendix tables for normal mode and HST.The appendix A (FRC) is assigned to @INTEL. Could HW and Intel please agree who does the extension to appendix A.6, how to do it (one vs. two tables), and then select the correct reference in this draftCR?The PRACH result seem to be stable now, so can the TBD be replaced? |
| Huawei: Thanks for your correction. We have uploaded a new version to fix these issues. Also A new Table A.6.7 is added to capture test preambles. |
| R4-2205762 | Draft CR on PRACH test requirement for high speed train (38.141-2), Huawei |
| Moderator: AWGN propagation condition does not have a correlation matrix. Can we remove the text “and correlation matrix” from the table for now?The PRACH result seem to be stable now, so can the TBD be replaced? |
| Huawei: Thanks for your correction. We have uploaded a new version to fix these issues. |
|  |

## Summary on 2nd round (if applicable)

*Moderator tries to summarize discussion status for 2nd round and provided recommendation on CRs/TPs/WFs/LSs Status update suggestion*

|  |  |
| --- | --- |
| **CR/TP/LS/WF number** | **T-doc Status update recommendation**  |
| XXX | *Based on 2nd round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |
|  |  |

# Recommendations for Tdocs

## 1st round

**New tdocs**

|  |  |  |
| --- | --- | --- |
| **Title** | **Source** | **Comments** |
| WF on … | YYY |  |
| LS on … | ZZZ | To: RAN\_X; Cc: RAN\_Y |
| WF on BS demodulation requirement for FR2 HST | Nokia, Nokia Shanghai Bell |  |

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation**  | **Comments** |
| R4-210xxxx | CR on … | XXX | Agreeable, Revised, Merged, Postponed, Not Pursued |  |
| R4-2204389 | DraftCR to TS 38.104: FRC for HST FR2 PUSCH performance requirements | Intel | Postponed | @Intel: Since MCS/SNR remain undecided this meeting it seems to make little sense to include PUSCH in specification |
| R4-2204390 | DraftCR to TS 38.104: HST FR2 PUSCH performance requirements | Intel | Postponed | @Intel: Since MCS/SNR remain undecided this meeting it seems to make little sense to include PUSCH in specification |
| R4-2204391 | DraftCR to TS 38.141-2: FRC for HST FR2 PUSCH performance requirements | Intel | Postponed | @Intel: Since MCS/SNR remain undecided this meeting it seems to make little sense to include PUSCH in specification |
| R4-2205033 | Draft CR on introduction of FR2 HST test procedure for PUSCH | Ericsson | Postponed | @Eri: Since MCS/SNR remain undecided this meeting it seems to make little sense to include PUSCH in specification |
| R4-2205761 | Draft CR on PRACH minimum requirements for high speed train (38.104),  | Huawei | Revised | @HW: Please check comments received and respond/revise. The PRACH SNR results seem complete and stable enough to be added to draftCR. Proposed to be revised, with the goal of being endorsed in 2nd round. |
| R4-2205762 | Draft CR on PRACH test requirement for high speed train (38.141-2) | Huawei | Revised | @HW: Please check comments received and respond/revise. The PRACH SNR results seem complete and stable enough to be added to draftCR. Proposed to be revised, with the goal of being endorsed in 2nd round. |

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 |  |
| R4-2207235 | WF on BS demodulation requirement for FR2 HST | Nokia, Nokia Shanghai Bell | Agreeable |  |
| R4-2207236 | Draft CR on PRACH minimum requirements for high speed train (38.104) | Huawei | Endorsed |  |
| R4-2207237 | Draft CR on PRACH test requirement for high speed train (38.141-2) | Huawei | Endorsed |  |
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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

|  |  |  |
| --- | --- | --- |
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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 your name as suffix after company name, when making comments, i.e. Company A (XX, XX).