**3GPP TSG RAN meeting #92e RP-21xxxx**

**Electronic Meeting, June 14 - 18, 2021**

## Status Report to TSG

**Agenda item:** 9.7.1.5

|  |  |
| --- | --- |
| **WI / SI Name** | **NR coverage enhancements** |
| included in this status report | Study Item: No | Core part: Yes | Performance part:Yes | Testing part:No |
| **Acronym** | NR\_cov\_enh |
| **Unique ID** | 900061 |
| **TSG Tdoc of latest approved WI/SI description (if any)** | RP-210855 |
| **Target Completion Date****(indicate if changed)** | Study Item: NA | Core part: 03/2022 | Performance part: 09/2022 | Testing part: NA |
| **Overall Completion level** | Study Item: NA | Core part: 40% | Performance Part: 0% | Testing part: NA |

Note: Overall completion level percentage numbers should use one of the colors below:

* xx%: Normal progress, no RAN plenary action needed
* xx%: Progress behind schedule, may need RAN plenary intervention. If so, SR should clearly define requested action
* xx%: Progress critically behind, RAN plenary shall intervene. SR should define requested action

**Source:**

|  |  |
| --- | --- |
| **Leading WG** | RAN WG1 |
| **Rapporteur** | **Name** | Jianchi Zhu |
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## 1 Work plan related evaluation

|  |  |
| --- | --- |
| **Do you want to modify the time budget for this WI/SI compared to what was endorsed at the last RAN meeting?** | No |

*If you answered No: Then please remove the Excel file from the zip file of this status report.*

*If you answered Yes: Then please fill out the attached Excel template to request a modification of the time budgets for your WI /SI. The Excel table has to be filled out for all affected RAN WGs and up to the target date of the WI/SI. The basis are the endorsed time budgets of the last RAN meeting. Please highlight all changes of the values.
 One time unit (TU) corresponds to ~ 2 hours in the meeting.
 If this status report covers a WI with Core and Performance part, then please have one line for each in the attached Excel table.
 Note: If no Excel table is attached, then this means no time budget change.*

**Additional explanations/motivations for the time budget changes in the attached Excel table:**

## 2. Detailed progress in RAN WGs since last TSG meeting (for all involved WGs)

 NOTE: Agreements and Open issues impacted cross-TSG aspects shall be explicitly highlighted

## 2.1 RAN1

#### 2.1.1 Agreements

RAN1 #104b-e

**PUSCH enhancements:**

Agreement:

Non-consecutive physical slots for UL transmission can be used to transmit TBoMS at least for unpaired spectrum.

* How TBoMS is transmitted over non-consecutive physical slots for UL transmission for unpaired spectrum is to be discussed further.
* Whether and how non-consecutive physical slots for UL transmission can be used to transmit TBoMS for paired spectrum and SUL band as well, is to be discussed further.

Working Assumption

The concept of transmission occasion for TBoMS (TOT) is utilized for the purpose of discussion, where a TOT is constituted of time domain resources which may or may not span multiple slots

* FFS: details, whether multiple slots which constitute a TOT are consecutive or non-consecutive physical slots for UL transmissions
* FFS: other details.
* FFS: whether such concept will be specified or not.

Agreements**:**

For the definition of a single TBoMS, down select among the following options:

* **Option 1**: Only one TOT is determined for a TBoMS. The TB is transmitted on the TOT using a single RV.
	+ FFS: whether and how the single RV is rate matched across the TOT, e.g., continuous rate-matching across the TOT, rate matched for each slot and so on.
* **Option 2**: Only one TOT is determined for a TBoMS. The TB is transmitted on the TOT using different RVs.
	+ FFS: how RV index is refreshed within the TOT, e.g. after each slot boundary, at every jump between two non-contiguous resources, if any, and so on.
* **Option 3**: Multiple TOTs are determined for a TBoMS. The TB is transmitted on the multiple TOTs using a single RV.
	+ FFS: how the single RV is rate matched across single or multiple TOTs, e.g., rate matched for each TOT, rate matched for all the TOTs, rate matched for each slot and so on.
* **Option 4**: Multiple TOTs are determined for a TBoMS. The TB is transmitted on the multiple TOTs using different RVs.
	+ FFS: whether and how RV index is refreshed within one TOT, e.g. after each slot boundary, at every jump between two non-contiguous resources, if any, and so on.
* FFS: the exact TBS determination procedure.
* FFS: whether a single TBoMS can be repeated or not.
* FFS: other implications, e.g., power control, collision handling and so on.

Agreements:

* For joint channel estimation, specify a time domain window during which a UE is expected to maintain power consistency and phase continuity among PUSCH transmissions subject to power consistency and phase continuity requirements.
	+ FFS how the time domain window is determined (e.g., via explicit configuration and/or implicitly derived) and whether or not to have the possibility of enabling/disabling the time domain window
	+ FFS the units the time domain window (e.g. repetitions, slots, and/or symbols)
		- FFS : association between the potential use case(s) and units of the time window
	+ FFS: single or multiple time domain windows
* FFS: relation with UE capability
* FFS: whether the term "time domain window" is used in the specification or replaced by other technical terms
* FFS whether or not to further consider impacting of timing advance

**Agreements:**

* A new DMRS pattern equally spaced among PUSCH transmissions is not considered for joint channel estimation in Rel-17.

**Agreements:**

* For inter-slot frequency hopping with inter-slot bundling, down select on the following two options:
	+ Option 1: The bundle size (time domain hopping interval) equals to the time domain window size.
	+ Option 2: The bundle size (time domain hopping interval) can be different from the time domain window size.
		- FFS: Whether the bundle size (time domain hopping interval) is explicitly configured or implicitly determined.
		- FFS: Whether/How the bundle size (time domain hopping interval) is defined separately for FDD and TDD.
		- FFS: relation between the bundle size (time domain hopping interval) and the time domain window size

**Conclusion:**

* For optimization of DMRS granularity in time domain with joint channel estimation, the proponents are encouraged to provide more simulation results in next meeting

**Agreements:**

* For the time domain window for joint channel estimation, down select on the following two options:
	+ Option 1: The unit of the time domain window is defined separately for the following PUSCH transmissions:
		- PUSCH repetition type A
		- PUSCH repetition type B, if agreed
		- TBoMS, if agreed
		- Different TB, if agreed
	+ Option 2: The unit of the time domain window is the same for the following PUSCH transmission:
		- PUSCH repetition type A
		- PUSCH repetition type B, if agreed
		- TBoMS, if agreed
		- Different TB, if agreed

**Agreement:**

* For back-to-back PUSCH transmissions across consecutive slots, support necessary design aspects (under the condition of power consistency and phase continuity) to enable joint channel estimation for the following cases:
	+ Over back-to-back PUSCH transmissions (of the same TB) for repetition type B scheduled by dynamic grant or configured grant, if it reuses only those joint channel estimation specification enhancements defined to support repetition Type A.
		- FFS: additional specification enhancements on top of that defined to support repetition Type A
		- Only for single layer transmissions
		- Subject to UE capability
	+ FFS: Over back-to-back PUSCH transmissions with different TBs

**Type A PUSCH repetitions for Msg3:**

Agreement: For Msg3 PUSCH repetition, support the following modified Option 2-1.

* Option 2-1: For UE requested Msg3 PUSCH repetition with gNB indicating the number of repetitions,
* A UE can request Msg3 PUSCH repetition via separate PRACH resources (FFS details, e.g., separate PRACH occasion or separate PRACH preamble in case of shared PRACH occasions after SSB association, etc.).
* Whether a UE would request ~~trigger~~ is based on some conditions, e.g., measured SS-RSRP threshold, which may or may not have spec impact.
* If Msg3 PUSCH repetition is requested triggered by UE, gNB decides whether to schedule Msg3 PUSCH repetition or not. If scheduled, gNB decides the number of repetitions for Msg3 PUSCH 3 (re)-transmission.
* FFS the UE capability of supporting Msg3 PUSCH repetition can be reported after initial access procedure as usual
* FFS details if any.

Agreements: For the determination of RV for Msg3 PUSCH repetition,

* RV of the first repetition is determined in the same way as legacy.
	+ Use RV 0 for the first repetition of Msg3 PUSCH initial transmission.
	+ Use a dynamically indicated RV id via DCI 0\_0 with CRC scrambled by TC-RNTI for the first repetition of Msg3 PUSCH re-transmission.
* FFS determination of the RV sequence.

Agreements: For indication of the number of repetitions for Msg3 initial transmission, Option 1 (i.e., using UL grant scheduling Msg3) is adopted.

* FFS additionally using MAC RAR for indication.

Agreements: For indication of the number of repetitions for Msg3 re-transmission, Option 1 (i.e., using DCI format 0\_0 with CRC scrambled by TC-RNTI) is adopted.

**Working assumption:**The number of repetitions is counted on the basis of available slots for Type A PUSCH repetitions for Msg3.

* FFS: the determination of available slots.

RAN1 #105-e

**PUSCH enhancements:**

Agreement:

* RV cycling is based on available slot for the Type A PUSCH repetition enhancement with repetitions counted based on available slot in Rel-17

Agreement:

* Down-selection in RAN1#106-e:
* Alt 1: The maximum number of repetitions supported by Rel-17 PUSCH repetition Type A is 32, irrespective of counting method,
* Alt 2: The maximum number of repetitions supported by Rel-17 PUSCH repetition Type A is: 32 for the counting based on physical slots; and 16 (i.e. no change from Rel-16) for the counting based on available slots.

**Conclusion:**

* The following agreement in RAN1#104-e is applied to all slots including special slots.

|  |
| --- |
| Agreements:For defining available slots: a slot is determined as unavailable if at least one of the symbols indicated by TDRA for a PUSCH in the slot overlaps with the symbol not intended for UL transmissions.* FFS details
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Agreement:

In addition to {1, 2, 3, 4, 7, 8, 12, 16} and {32}, the following additional value set for repetition factor is supported in Rel-17.

* {20, 24, 28}

Agreement:

* Each available slot identified by the UE is considered as a transmission occasion for PUSCH repetition.
	+ RV is cycled across transmission occasions, irrespective of whether PUSCH transmission in the transmission occasion is further omitted or not.

Agreement:

* If PUSCH symbol in a slot overlaps with flexible symbol(s) with SSB transmission, the slot is determined as not available during the counting of repetitions. As there is no PUSCH in the slot, no PUSCH omission applies to the slot.

Agreement:

Select one from the following (further refinement of the alternatives can be further discussed), for the procedure of Rel-17 PUSCH repetition Type A (other alternatives are not precluded)

* Alt 1-B consisting of two steps
	+ Step 1: Determine available slots for K repetitions based on RRC configuration(s) in addition to TDRA in the DCI scheduling the PUSCH, CG configuration or activation DCI
	+ Step 2: The UE determines whether to drop a PUSCH repetition or not according to Rel-15/16 PUSCH dropping rules, but the PUSCH repetition is still counted in the K repetitions.
* Alt 1-B’ consisting of two steps
	+ Step 1: Determine K repetitions based on available slots, where the available slot is the UL slot and flexible slot indicated by *tdd-UL-DL-ConfigurationCommon*, or *tdd-UL-DL-ConfigurationDedicated*.
	+ Step 2: The UE determines whether to drop a PUSCH repetition or not according to Rel-15/16 PUSCH dropping rules, but the PUSCH repetition is still counted in the K repetitions.
	+ FFS: handling of dynamic signaling (e.g. UL CI, DCI for high priority channel), e.g., UE without CI capability
* Alt 2-A consisting of a single step
	+ Step 1: Determine available slots for K repetitions based on RRC configuration(s) and dynamic signaling (e.g. SFI, UL CI, DCI for high priority channel) in addition to TDRA in the DCI scheduling the PUSCH, CG configuration or activation DCI
* Alt 2-B consisting of two steps
	+ Step 1: Determine available slots for K repetitions based on RRC configuration(s) and dynamic SFI in addition to TDRA in the DCI scheduling the PUSCH, CG configuration or activation DCI
		- FFS timeline for the dynamic signalling
	+ Step 2: The UE determines whether to drop a PUSCH repetition or not according to Rel-15/16 PUSCH dropping rules, but the PUSCH repetition is still counted in the K repetitions.

Working assumption: 🡪 Agreement:

For TBS determination of TBoMS:

* *NohPRB* is configured by xOverhead and represents the overhead per slot.
* *NohPRB* is assumed to be the same for all the slots over which the TBoMS transmission is allocated.

Note: xOverhead configuration is as per Rel-15/16.

Agreement:

The following 2 options for time domain resource determination for TBoMS are considered for down-selection during RAN1 #105-e:

* Option 1: Time domain resource determination for TBoMS can be performed only via PUSCH repetition Type A like TDRA.
* Option 2: Time domain resource determination for TBoMS can be performed via PUSCH repetition Type A like TDRA or via PUSCH repetition Type B like TDRA.
	1. The use of PUSCH repetition Type B like TDRA for time domain resource determination is according to an additional UE capability for a TBoMS capable UE.
	2. FFS DMRS pattern for PUSCH repetition Type B like TDRA

**Working assumption**

A transmission occasion for TBoMS (TOT) is constituted of at least one slot or multiple consecutive physical slots for UL transmission

* FFS: whether the concept of TOT will be used for designing aspects related to signal generation, e.g., rate-matching, power control, etc.
* FFS: whether such concept will be specified or not.

Agreement:

* The structure of TBoMS will be according to only one of these two options (to be down-selected in RAN1#106-e)
	+ Option 3, if a design based on single RV is adopted.
	+ Option 4, if a design based on different RVs is adopted.
* FFS: other details, e.g., rate-matching, TBS determination, collision handling, etc.
* The single RV is not constrained to have only the same coded bits in each slot or in each TOT
* The concept of TOT as per the corresponding Working assumption is used to define Option 3 and Option 4 and may or may not be used to design other details, e.g., rate-matching, TBS determination, collision handling and so on.

Agreement:

Time domain resource determination for TBoMS can be performed only via PUSCH repetition Type A like TDRA.

* FFS: details
* FFS: whether or not optimizations for time domain resource determination are necessary for allocating resource in the S slots (for the unpaired spectrum case)

**Working assumption**

Allocating resources for TBoMS in the special slot in TDD is possible according to the agreed time domain resource determination for TBoMS.

Agreement:

The following three options for rate-matching for TBoMS are considered for down-selection during RAN1 #106-e, where only one option will be selected:

* Option a: Rate-matching is performed per slot;
* Option b: Rate matching is performed continuously across all the allocated slot(s) per TOT;
* Option c: Rate matching is performed continuously across all the allocated slots/TOTs for TBoMS

Note: “rate-matching is performed per X” means that the time unit for the bit selection and bit interleaving is X.

Note2: the above 3 options imply that the UL resource in the time unit may or may not be consecutive (depending on the given option)

Agreement:

Number of slots allocated for TBoMS is determined by using a row index of a TDRA list, configured via RRC.

* FFS: details.

Agreement:

The following approach is used to calculate NInfo for TBoMS:

* Approach 2: Based on the number of REs determined in the first L symbols over which the TBoMS transmission is allocated, scaled by K≥1.
	+ FFS: the definition of K.

L is the number of symbols determined using the SLIV of PUSCH indicated via TDRA

FFS: impacts and further details if repetitions of TBoMS is supported.

FFS: whether the symbols over which the TBoMS transmission is allocated are the same or can be different from the symbols over which the TBoMS transmission is performed, and details on how to handle such scenarios.

Agreement**:**

* Joint channel estimation over non-back-to-back PUSCH transmissions within one slot is not supported.

Agreement:

* Definition of the maximum duration: a maximum time duration during which UE is able to maintain power consistency and phase continuity subject to power consistency and phase continuity requirements.
* FFS whether or not such a definition is necessary for RAN1 specifications.
	+ Note: whether such a definition is to be specified in RAN4 specifications is up to RAN4.
* FFS the maximum duration may be reported by UE.
* Note: it is understood that for a UE, the maximum duration is no less than the time domain window duration

Agreement:Send LS to RAN4 asking the following questions

* For joint channel estimation, is there a maximum duration during which UE is able to maintain power consistency and phase continuity under certain tolerance level? If any, how long is it?
	+ What factors determine the maximum duration?
	+ Whether the maximum duration should be the same for different cases for both PUSCH and PUCCH?
	+ Whether the maximum duration is dependent on the modulation order of transmission, e.g., QPSK, 16QAM, 64QAM?
	+ Whether the maximum duration is dependent on UL waveform (DFT-s-OFDM vs. OFDM)?
	+ Whether the maximum duration is band specific?
	+ Besides the factors listed above, whether or not the maximum duration is further dependent on UE capabilities (e.g., multiple possible values for a given set of factor(s)), and if so, whether the UE should report such a duration

Draft LS to RAN4 is approved, with final LS in R1-2106212.

Agreement:

* Optimization of DMRS granularity in time domain for PUSCH is not considered for joint channel estimation in Rel-17.

Agreement:

* For back-to-back PUSCH transmissions within one slot, support necessary design aspects (under the condition of power consistency and phase continuity) to enable joint channel estimation for the following cases:
	+ Over back-to-back PUSCH transmissions (of the same TB) for repetition type B scheduled by dynamic grant or configured grant, if it reuses only those joint channel estimation specification enhancements defined to support repetition Type A with consecutive slots
		- FFS: additional specification enhancements on top of that defined to support repetition Type A
		- Only for single layer transmissions
		- Subject to UE capability
* Joint channel estimation over back-to-back PUSCH transmissions with different TBs within one slot is not supported.

**Working assumption:**

* For non-back-to-back PUSCH transmissions (at least for the case of the same TB) across consecutive slots, support necessary design aspects (under the condition of power consistency and phase continuity) to enable joint channel estimation for the following cases:
	+ Over non-back-to-back PUSCH transmissions (of the same TB) for repetition type A scheduled by dynamic grant or configured grant.
	+ Over non-back-to-back PUSCH transmissions (of the same TB) for repetition type B scheduled by dynamic grant or configured grant, if it reuses only those joint channel estimation specification enhancements defined to support repetition Type A.
		- FFS: additional specification enhancements on top of that defined to support repetition Type A
		- Only for single layer transmissions
		- Subject to UE capability
	+ FFS: Over non-back-to-back PUSCH transmissions with different TBs
	+ FFS: Over non-back-to-back PUSCH transmissions for TBoMS
	+ For the non-back-to-back PUSCH transmissions, it is defined as at least when there is no UL transmission between the two successive PUSCH transmissions
	+ Subject to UE capability with details FFS (e.g., separate vs. joint capability for type A & type B, w.r.t. OFF power requirements, etc.)
* FFS: Joint channel estimation over non-back-to-back PUSCH transmissions with other uplink transmissions between the two successive PUSCH transmissions across consecutive slot.

Agreement:

* Joint channel estimation for PUSCH transmissions is enabled or disabled via RRC configuration for a UE
	+ FFS: whether additional dynamic signaling is needed to enable/disable joint channel estimation for PUSCH transmissions
	+ Note: the enabling of such a feature is subject to certain prerequisites
	+ FFS RRC parameter details (including explicit vs. implicit configuration)
* FFS For joint channel estimation for PUSCH, the time domain window is not explicitly enabled or disabled separately from joint channel estimation.

Note: Enabling/disabling of joint channel estimation for PUSCH transmissions means enabling/disabling of DMRS bundling for PUSCH transmissions under the condition of power consistency and phase continuity.

Agreement:

For joint channel estimation for PUSCH repetition type A of PUSCH repetitons of the same TB, down select one of the following alternatives for the time domain window.

* Alt 1: All the repetitions are covered by one single time domain window
	+ The start of the window is the first PUSCH transmission
	+ FFS: how to handle non-consecutive physical slots for UL transmission, e.g., due to DL/UL configuration for unpaired spectrum
	+ FFS: frequency hopping and precoder cycling
* Alt 2: All the repetitions are covered by one or multiple time domain windows
	+ For the start of each window,
		- The start of the first window is the first PUSCH transmission.
		- FFS: how to determine the start of other windows, e.g., whether multiple windows are consecutive or non-consecutive, whether the start of the window depends on DL/UL configuration for unpaired spectrum
	+ For the length of each window,
		- FFS Each window consists of at least two adjacent physical slots for UL transmission.
		- The length of each window is no longer than the maximum duration.
		- FFS: how to determine the length of each window
		- FFS: whether the length of each window depends on DL/UL configuration for unpaired spectrum
	+ FFS: how to handle non-consecutive physical slots for UL transmission, e.g., due to DL/UL configuration for unpaired spectrum.
	+ FFS: frequency hopping and precoder cycling
* Other alternatives are not precluded.

**PUCCH enhancements:**

Agreement: For DMRS bundling for PUCCH repetitions, specify a time domain window during which a UE is expected to maintain power consistency and phase continuity among PUCCH repetitions subject to power consistency and phase continuity requirements.

* Strive for common design of the time domain window for PUSCH/PUCCH with DMRS bundling as much as possible.

Working assumption: In Rel-17, for a PUCCH with associated scheduling DCI, support the following for dynamic PUCCH repetition factor indication.

* Enhance RRC signaling to allow configuration of PUCCH repetition factor per PUCCH resource. Reuse Rel-16 PUCCH resource indication mechanism based on “PUCCH resource indicator” (PRI) field and starting CCE index (when applicable based on Rel-16 spec) of DCI to indicate a PUCCH resource and its associated repetition factor.
	+ FFS: RRC signaling enhancement details

**Conclusion**: For PUCCH repetitions, the following use cases are deprioritized in RAN1 work on PUCCH DMRS bundling

* Use case 1: back-to-back PUCCH repetitions within one slot.
* Use case 2: non-back-to-back PUCCH repetitions within one slot.
	+ Use case 2a: no uplink transmission in the middle of two PUCCH repetitions
	+ Use case 2b: other uplink transmissions in the middle of two PUCCH repetitions

**Type A PUSCH repetitions for Msg3:**

Agreement: A UE requests Msg3 PUSCH repetition at least when the RSRP of the downlink pathloss reference is lower than an RSRP threshold.

* FFS the determination of the RSRP threshold.

Agreement: For repetition indication of Msg3 re-transmission, select one options from the following two options.

* Option 1: Use the same mechanism as supported for Msg3 initial transmission.
* Option2: Use HARQ process number bit field in DCI format 0\_0 with CRC scrambled by TC-RNTI.

Agreement: Available slot for Msg3 PUSCH repetition doesn’t depend on dynamic SFI in DCI format 2-0.

Agreement: Available slot for Msg3 PUSCH repetition doesn’t depend on UL CI.

Agreement: Use a fixed RV sequence [0 2 3 1] for repetition of Msg3 initial and re-transmission.

* The RV cycling for Msg3 initial transmission follows the rule specified in the first row in Table 6.1.2.1-2 in TS38.214.
* The RV cycling for Msg3 re-transmission follows the rules specified in Table 6.1.2.1-2 in TS38.214.
* FFS: The RV cycling for Msg3 is based on transmission occasions on available slot.

Agreement:

* For requesting Msg3 PUSCH repetition, support the following:
	+ Use separate preamble with shared RO configured by the same PRACH configuration index with legacy UEs.
		- FFS whether to introduce a PRACH mask to indicate a sub-set of ROs associated with a same SSB index within an SSB-RO mapping cycle for requesting Msg3 repetition for a UE.
		- FFS definition of shared RO (e.g., whether the shared RO can be an RO with preamble(s) for 4-step RACH only or with preambles for both 4-step RACH and 2-step RACH).
	+ FFS whether or not to additionally support one (& only one) more option:
		- E.g., option 2: Use separate RO configured by a separate PRACH configuration index from legacy UEs
		- E.g., Option 3: Use separate RO, which include
			* the separate RO configured by a separate RACH configuration index from legacy UE, and
			* the remaining RO (if any) configured, by the same PRACH configuration index with legacy UEs, that cannot be used by legacy rules for PRACH transmission.

Agreement**:** Available slots for Msg3 PUSCH repetition do not depend on *tdd-UL-DL-ConfigurationDedicated*.

Agreement**:** Available slot for Msg3 PUSCH repetition depends on *TDD-UL-DL-Configcommon*.

* A slot is determined as available for Msg3 repetition only if the consecutive symbols allocated for Msg3 repetition in the slot are all available symbols.
	+ UL symbols indicated by *TDD-UL-DL-Configcommon* are determined as available for Msg3 repetition.
	+ FFS whether and how to use flexible symbols indicated by *TDD-UL-DL-Configcommon*.

Working assumption:

* Using an information field from the existing information fields in RAR UL grant for indication of the number of repetition of Msg3 initial transmission
	+ Down-select only one from the following information fields in RAR UL grant for indication of the number of repetition of Msg3 initial transmission.
		- TDRA information field with introducing a new TDRA table including the repetition factors.
		- MCS information field
		- TPC information field
		- CSI request information field
		- FDRA information field
* The total size of RAR UL grant does not change.
* Position of all fields in the bit sequence of the RAR UL grant does not change, regardless of whether they are repurposed or not.
* FFS details, e.g., TDRA table selection, or whether/how to indicate which interpretation UE should use for the repurposed information field (legacy vs repurposed interpretation) etc.

**Conclusion:**

* Companies are encouraged to perform additional evaluations regarding intra-slot frequency hopping for Msg 3 with repetition. Aim to conclude whether or not to support this feature in RAN1#106-e (note: if supported, the intention is to not configure intra- and inter-slot frequency hopping simultaneously)

#### 2.1.2 Remaining Open issues

* PUSCH enhancements
	+ Detailed mechanisms for enhancements on PUSCH repetition type A
		- Increasing the maximum number of repetitions.
		- The number of repetitions counted on the basis of available UL slots.
	+ Detailed mechanism(s) to support TB processing over multi-slot PUSCH
		- TBS determined based on multiple slots and transmitted over multiple slots.
	+ Detailed mechanism(s) to support joint channel estimation
		- Mechanism(s) to enable joint channel estimation over multiple PUSCH transmissions
			* Potential optimization of DMRS location in time domain is not precluded
		- Inter-slot frequency hopping with inter-slot bundling to enable joint channel estimation
* PUCCH enhancements
	+ Detailed signaling mechanism to support dynamic PUCCH repetition factor indication
	+ Detailed mechanism to support DMRS bundling across PUCCH repetitions
* Detailed mechanism(s) to support Type A PUSCH repetitions for Msg3

## 2.2 RAN2

#### 2.2.1 Agreements

#### 2.2.2 Remaining Open issues

## 2.3 RAN3

#### 2.3.1 Agreements

#### 2.3.2 Remaining Open issues

## 2.4 RAN4

#### 2.4.1 Agreements

The progress in RAN4 #98e-bis meeting is summarized below:

* The email discussion summary for [98-bis-e][140] NR\_cov\_enh was provided in R4-2105477.
* The reply LS on PUCCH and PUSCH repetition was approved in R4-2105417.
* The way forward on phase continuity and power consistency for PUCCH and PUSCH repetition was approved in R4-2105418.

The progress in RAN4 #99e meeting is summarized below:

* The email discussion summary for [99-e][147] NR\_cov\_enh was provided in R4-2107957.
* The reply LS on PUCCH and PUSCH repetition was approved in R4-2107880.
* The way forward on phase continuity and power consistency for PUCCH and PUSCH repetition was approved in R4-2107881.

#### 2.4.2 Remaining Open issues

* Conditions for joint channel estimation to keep power consistency and phase continuity (with certain tolerance) to be investigated and specified if necessary by RAN4.

## 2.5 RAN5

#### 2.5.1 Agreements

#### 2.5.2 Remaining Open issues

#### 2.5.3 Remaining Open issues with cross-WG dependencies

## 2.6 RAN6

#### 2.6.1 Agreements

#### 2.6.2 Remaining Open issues

## 3. Detailed progress in SA/CT WGs since last TSG meeting (for all involved WGs)

NOTE: This section only needs to be filled in for WI/SIs where there is a corresponding relevant WI/SI in SA/CT.

## 3.1 SAx/CTs

#### 3.1.1 Agreements with cross-TSG impacts

#### 3.1.2 Remaining Open issues with cross-TSG impacts

NOTE: This section should also flag any critical dependencies that need TSG attention.

## 4. References

NOTE: This can be e.g. a list of all related Tdocs in the affected WGs since last TSG, references to LSs, produced TRs/TSs, the work/study item description or status reports of previous TSGs.

RAN1 #104b-e:

1. R1-2103876 FL summary of TB processing over multi-slot PUSCH Moderator (Nokia, Nokia Shanghai Bell)
2. R1-2104102 Final FL summary of TB processing over multi-slot PUSCH Moderator (Nokia, Nokia Shanghai Bell)
3. R1-2103808 FL Summary of joint channel estimation for PUSCH Moderator (China Telecom)
4. R1-2104006 [104b-e-NR-R17-CovEnh-02] Summary of email discussion on joint channel estimation for PUSCH Moderator (China Telecom)
5. R1-2103829 Feature lead summary #1 on support of Type A PUSCH repetitions for Msg3 Moderator (ZTE Corporation)
6. R1-2104101 Feature lead summary #2 on support of Type A PUSCH repetitions for Msg3 Moderator (ZTE Corporation)
7. R1-2104119 Reply LS on PUCCH and PUSCH repetition RAN1, Qualcomm
8. [R1-2102314](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2102314.zip) Discussion on TB processing over multi-slot PUSCH Huawei, HiSilicon
9. [R1-2102408](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2102408.zip) Issues for TB over multi-slot PUSCH OPPO
10. [R1-2102498](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2102498.zip) Discussion on TB processing over multi-slot PUSCH ZTE
11. [R1-2102535](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2102535.zip) Discussion on PUSCH TB processing over multiple slots vivo
12. [R1-2102644](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2102644.zip) Discussion on TB processing over multi-slot PUSCH CATT
13. [R1-2102691](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2102691.zip) Discussion on TB processing over multi-slot PUSCH MediaTek Inc.
14. [R1-2102718](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2102718.zip) Views on TB processing over multi-slot PUSCH Fujitsu
15. [R1-2102861](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2102861.zip) Discussion on TB processing over multi-slot PUSCH China Telecom
16. [R1-2102894](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2102894.zip) Discussion on TB processing over multi-slot PUSCH CMCC
17. [R1-2102913](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2102913.zip) On TB processing over multiple slots for PUSCH Indian Institute of Tech (H)
18. [R1-2102993](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2102993.zip) TB processing over multi-slot PUSCH Xiaomi
19. [R1-2103008](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2103008.zip) TB processing over multi-slot PUSCH InterDigital, Inc.
20. [R1-2103043](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2103043.zip) Discussion on TB processing over multi-slot PUSCH Intel Corporation
21. [R1-2103117](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2103117.zip) Discussion on TB processing over multi-slot PUSCH Apple
22. [R1-2103179](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2103179.zip) TB processing over multi-slot PUSCH Qualcomm Incorporated
23. [R1-2103208](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2103208.zip) Discussion on TB processing over multi-slot PUSCH Panasonic Corporation
24. [R1-2103252](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2103252.zip) TB processing over multi-slot PUSCH Samsung
25. [R1-2103381](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2103381.zip) Transport block processing for PUSCH coverage enhancements Nokia, Nokia Shanghai Bell
26. [R1-2103445](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2103445.zip) TB Processing over Multi-Slot PUSCH Ericsson
27. [R1-2103461](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2103461.zip) Design Considerations for TB Processing over Multi-Slot PUSCH Sierra Wireless, S.A.
28. [R1-2103480](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2103480.zip) TB processing over multi-slot PUSCH Sharp
29. [R1-2103514](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2103514.zip) Discussion on TB processing over multi-slot PUSCH NEC
30. [R1-2103588](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2103588.zip) TB processing over multi-slot PUSCH NTT DOCOMO, INC.
31. [R1-2103616](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2103616.zip) Enhancements for TB processing over multi-slot PUSCH Lenovo, Motorola Mobility
32. [R1-2103625](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2103625.zip) Discussions on TB processing over multi-slot PUSCH LG Electronics
33. [R1-2103700](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2103700.zip) Discussion on TB processing over multi-slot PUSCH WILUS Inc.
34. [R1-2102313](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2102313.zip) Discussion on Joint channel estimation for PUSCH Huawei, HiSilicon
35. [R1-2102409](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2102409.zip) Consideration on Joint channel estimation for PUSCH OPPO
36. [R1-2102465](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2102465.zip) Consideration on joint channel estimation over multi-PUSCH Spreadtrum Communications
37. [R1-2102499](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2102499.zip) Discussion on joint channel estimation for PUSCH ZTE
38. [R1-2102536](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2102536.zip) Discussion on Joint channel estimation for PUSCH vivo
39. [R1-2102645](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2102645.zip) Discussion on joint channel estimation for PUSCH CATT
40. [R1-2102692](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2102692.zip) Discussion on joint channel estimation for PUSCH MediaTek Inc.
41. [R1-2102862](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2102862.zip) Discussion on joint channel estimation for PUSCH China Telecom
42. [R1-2102895](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2102895.zip) Discussion on joint channel estimation for PUSCH CMCC
43. [R1-2102994](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2102994.zip) Joint channel estimation for PUSCH Xiaomi
44. [R1-2103009](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2103009.zip) Discussions on joint channel estimation for PUSCH InterDigital, Inc.
45. [R1-2103044](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2103044.zip) Discussion on joint channel estimation for PUSCH Intel Corporation
46. [R1-2103118](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2103118.zip) Discussion on joint channel estimation for PUSCH Apple
47. [R1-2103180](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2103180.zip) Joint channel estimation for PUSCH Qualcomm Incorporated
48. [R1-2103253](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2103253.zip) Joint channel estimation for PUSCH Samsung
49. [R1-2103312](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2103312.zip) UE configuration for enhanced JCE in TDD Sony
50. [R1-2103382](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2103382.zip) Joint channel estimation for PUSCH coverage enhancements Nokia, Nokia Shanghai Bell
51. [R1-2103446](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2103446.zip) Joint Channel Estimation for PUSCH Ericsson
52. [R1-2103458](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2103458.zip) Discussion on joint channel estimation for PUSCH Panasonic Corporation
53. [R1-2103460](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2103460.zip) Design Considerations for Joint channel estimation for PUSCH Sierra Wireless, S.A.
54. [R1-2103481](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2103481.zip) Joint channel estimation for multi-slot PUSCH Sharp
55. [R1-2103589](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2103589.zip) Joint channel estimation for PUSCH NTT DOCOMO, INC.
56. [R1-2103617](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2103617.zip) Enhancements for joint channel estimation for multiple PUSCH Lenovo, Motorola Mobility
57. [R1-2103626](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2103626.zip) Discussions on joint channel estimation for PUSCH LG Electronics
58. [R1-2103701](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2103701.zip) Discussion on joint channel estimation for PUSCH WILUS Inc.
59. [R1-2102315](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2102315.zip) Discussion on Msg3 repetition for coverage enhancement Huawei, HiSilicon
60. [R1-2102410](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2102410.zip) Type A PUSCH repetitions for Msg3 coverage OPPO
61. [R1-2102466](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2102466.zip) Discussion on type A PUSCH repetitions for Msg3 Spreadtrum Communications
62. [R1-2102500](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2102500.zip) Discussion on support of Type A PUSCH repetitions for Msg3 ZTE
63. [R1-2102537](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2102537.zip) Discussion on Type A PUSCH repetitions for Msg3 vivo
64. [R1-2102646](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2102646.zip) Discussion on Type A PUSCH repetitions for Msg3 CATT
65. [R1-2102863](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2102863.zip) Discussion on type A PUSCH repetitions for Msg3 China Telecom
66. [R1-2103772](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2103772.zip) Discussion on type A PUSCH repetitions for Msg3 CMCC
67. [R1-2102995](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2102995.zip) Type A PUSCH repetition for Msg3 Xiaomi
68. [R1-2103010](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2103010.zip) Type A PUSCH repetitions for Msg3 InterDigital, Inc.
69. [R1-2103045](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2103045.zip) On Msg3 PUSCH repetition Intel Corporation
70. [R1-2103119](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2103119.zip) Discussion on Msg3 Coverage Enhancement Apple
71. [R1-2103181](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2103181.zip) Type A PUSCH repetition for Msg3 Qualcomm Incorporated
72. [R1-2103209](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2103209.zip) Discussion on Type A PUSCH repetitions for Msg.3 Panasonic Corporation
73. [R1-2103254](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2103254.zip) Type A PUSCH repetitions for Msg3 Samsung
74. [R1-2103329](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2103329.zip) Type A PUSCH repetitions for Msg3 ETRI
75. [R1-2103383](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2103383.zip) Approaches and solutions for Type A PUSCH repetitions for Msg3 Nokia, Nokia Shanghai Bell
76. [R1-2103447](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2103447.zip) Type A PUSCH Repetition for Msg3 Ericsson
77. [R1-2103482](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2103482.zip) Type A repetition for msg3 PUSCH Sharp
78. [R1-2103515](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2103515.zip) Discussion on PUSCH repetitions for Msg3 NEC
79. [R1-2103590](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2103590.zip) Type A PUSCH repetitions for Msg3 NTT DOCOMO, INC.
80. [R1-2103618](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2103618.zip) Type A PUSCH repetition for Msg3 Lenovo, Motorola Mobility
81. [R1-2103627](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2103627.zip) Discussion on coverage enhancement for Msg3 PUSCH LG Electronics
82. [R1-2103702](file:///C%3A%5CUsers%5Cwanshic%5CAppData%5CLocal%5CDocs%5CR1-2103702.zip) Discussion on Type A PUSCH repetitions for Msg3 WILUS Inc.

RAN1 #105-e:

1. R1-2105992 FL Summary on Enhancements on PUSCH repetition type A Moderator (Sharp)
2. R1-2106155 FL Summary on Enhancements on PUSCH repetition type A Moderator (Sharp)
3. R1-2106199 FL Summary on Enhancements on PUSCH repetition type A Moderator (Sharp)
4. R1-2106279 FL Summary on Enhancements on PUSCH repetition type A Moderator (Sharp)
5. R1-2105996 FL summary of TB processing over multi-slot PUSCH Moderator (Nokia, Nokia Shanghai Bell)
6. R1-2106250 FL summary #2 of TB processing over multi-slot PUSCH Moderator (Nokia, Nokia Shanghai Bell)
7. R1-2106251 Final FL summary of TB processing over multi-slot PUSCH Moderator (Nokia, Nokia Shanghai Bell)
8. R1-2105979 FL Summary of joint channel estimation for PUSCH Moderator (China Telecom)
9. R1-2106152 [105-e-NR-R17-CovEnh-03] Summary of email discussion on joint channel estimation for PUSCH Moderator (China Telecom)
10. R1-2106212 LS on joint channel estimation for PUSCH and PUCCH RAN1, China Telecom
11. R1-2106014 FL summary of PUCCH coverage enhancement Moderator (Qualcomm)
12. R1-2106154 FL summary #2 of PUCCH coverage enhancement Moderator (Qualcomm)
13. R1-2106007 Feature lead summary #1 on support of Type A PUSCH repetitions for Msg3 Moderator (ZTE Corporation)
14. R1-2106247 Final feature lead summary on support of Type A PUSCH repetitions for Msg3 Moderator (ZTE Corporation)
15. [R1-2104240](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2104240.zip) Discussion on coverage enhancements for PUSCH repetition type A Huawei, HiSilicon
16. [R1-2104291](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2104291.zip) Discussion on enhancements on PUSCH repetition Type A for low latency requirement NICT, TOYOTA MOTOR CORPORATION
17. [R1-2104330](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2104330.zip) Discussion on enhanced PUSCH repetition type A ZTE
18. [R1-2104376](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2104376.zip) Discussion on enhancement for PUSCH repetition type A vivo
19. [R1-2104537](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2104537.zip) Discussion on enhancements on PUSCH repetition type A CATT
20. [R1-2104625](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2104625.zip) Discussion on enhancements on PUSCH repetition type A CMCC
21. [R1-2104685](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2104685.zip) Enhancements on PUSCH Repetition Type A Qualcomm Incorporated
22. [R1-2104792](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2104792.zip) Enhancements on PUSCH repetition type A OPPO
23. [R1-2104846](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2104846.zip) Enhancements on PUSCH repetition type A China Telecom
24. [R1-2104859](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2104859.zip) Type-A PUSCH repetition for coverage enhancement InterDigital, Inc.
25. [R1-2104919](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2104919.zip) Enhancements on PUSCH repetition type A Intel Corporation
26. [R1-2105119](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105119.zip) Discussion on PUSCH repetition type A enhancement Apple
27. [R1-2105146](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105146.zip) Discussion on enhancements on PUSCH repetition Type A Panasonic Corporation
28. [R1-2105255](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105255.zip) Discussion on PUSCH repetition type A NEC
29. [R1-2105325](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105325.zip) Enhancements on PUSCH repetition type A Samsung
30. [R1-2105488](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105488.zip) Discussions on PUSCH repetition type A enhancements LG Electronics
31. [R1-2105511](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105511.zip) Design considerations for PUSCH repetition Type A Enhancements Sierra Wireless, S.A.
32. [R1-2105575](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105575.zip) Enhancements on PUSCH repetition type A Xiaomi
33. [R1-2105640](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105640.zip) Enhancements on PUSCH repetition type A Sharp
34. [R1-2105652](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105652.zip) PUSCH Repetition Type A Enhancement Ericsson
35. [R1-2105711](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105711.zip) Enhancement on PUSCH repetition type A NTT DOCOMO, INC.
36. [R1-2105773](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105773.zip) Enhancements on PUSCH repetition type A Lenovo, Motorola Mobility
37. [R1-2105877](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105877.zip) Discussion on enhancements on PUSCH repetition type A WILUS Inc.
38. [R1-2105901](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105901.zip) Enhancements on PUSCH repetition type A Nokia, Nokia Shanghai Bell
39. [R1-2104242](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2104242.zip) Discussion on TB processing over multi-slot PUSCH Huawei, HiSilicon
40. [R1-2104297](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2104297.zip) On TB processing over multiple slots for PUSCH Indian Institute of Tech (H)
41. [R1-2104331](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2104331.zip) Discussion on TB processing over multi-slot PUSCH ZTE
42. [R1-2104377](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2104377.zip) Discussion on PUSCH TB processing over multiple slots vivo
43. [R1-2104436](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2104436.zip) Discussion on TB processing over multi-slot PUSCH Spreadtrum Communications
44. [R1-2104538](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2104538.zip) Discussion on TB processing over multi-slot PUSCH CATT
45. [R1-2104626](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2104626.zip) Discussion on TB processing over multi-slot PUSCH CMCC
46. [R1-2104686](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2104686.zip) TB processing over multi-slot PUSCH Qualcomm Incorporated
47. [R1-2104793](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2104793.zip) Issues for TB over multi-slot PUSCH OPPO
48. [R1-2104847](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2104847.zip) Discussion on TB processing over multi-slot PUSCH China Telecom
49. [R1-2104860](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2104860.zip) TB processing over multiple slots InterDigital, Inc.
50. [R1-2104920](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2104920.zip) Discussion on TB processing over multi-slot PUSCH Intel Corporation
51. [R1-2105064](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105064.zip) Views on TB processing over multi-slot PUSCH Fujitsu
52. [R1-2105120](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105120.zip) Discussion on TB processing over multi-slot PUSCH Apple
53. [R1-2105147](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105147.zip) Discussion on TB processing over multi-slot PUSCH Panasonic Corporation
54. [R1-2105256](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105256.zip) Discussion on TB processing over multi-slot PUSCH NEC
55. [R1-2105326](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105326.zip) TB processing over multi-slot PUSCH Samsung
56. R1-2105968 Discussion on TB processing over multi-slot PUSCH MediaTek Inc.
57. Revision of [R1-2105384](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105384.zip)
58. [R1-2105489](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105489.zip) Discussions on TB processing over multi-slot PUSCH LG Electronics
59. [R1-2105510](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105510.zip) Design Considerations for TB processing over multi-slot PUSCH Sierra Wireless, S.A.
60. [R1-2105576](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105576.zip) Discussion on TB processing over multi-slot PUSCH Xiaomi
61. [R1-2105641](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105641.zip) TB processing over multi-slot PUSCH Sharp
62. [R1-2105653](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105653.zip) TB Processing over Multi-Slot PUSCH Ericsson
63. [R1-2105712](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105712.zip) TB processing over multi-slot PUSCH NTT DOCOMO, INC.
64. [R1-2105774](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105774.zip) Enhancements for TB processing over multi-slot PUSCH Lenovo, Motorola Mobility
65. [R1-2105878](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105878.zip) Discussion on TB processing over multi-slot PUSCH WILUS Inc.
66. [R1-2105902](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105902.zip) Transport block processing for PUSCH coverage enhancements Nokia, Nokia Shanghai Bell
67. [R1-2104241](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2104241.zip) Discussion on joint channel estimation for PUSCH Huawei, HiSilicon
68. [R1-2104332](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2104332.zip) Discussion on joint channel estimation for PUSCH ZTE
69. [R1-2104378](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2104378.zip) Discussion on Joint channel estimation for PUSCH vivo
70. [R1-2104437](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2104437.zip) Discussion on joint channel estimation for PUSCH Spreadtrum Communications
71. [R1-2104539](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2104539.zip) Discussion on joint channel estimation for PUSCH CATT
72. [R1-2104627](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2104627.zip) Discussion on joint channel estimation for PUSCH CMCC
73. [R1-2104687](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2104687.zip) Joint channel estimation for PUSCH Qualcomm Incorporated
74. [R1-2104794](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2104794.zip) Consideration on Joint channel estimation for PUSCH OPPO
75. [R1-2104848](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2104848.zip) Discussion on joint channel estimation for PUSCH China Telecom
76. [R1-2104861](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2104861.zip) Joint channel estimation for PUSCH InterDigital, Inc.
77. [R1-2104882](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2104882.zip) Discussion on joint channel estimation for PUSCH TCL Communication Ltd.
78. [R1-2104921](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2104921.zip) Discussion on joint channel estimation for PUSCH Intel Corporation
79. [R1-2105121](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105121.zip) Discussion on joint channel estimation for PUSCH Apple
80. [R1-2105176](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105176.zip) Joint channel estimation for PUSCH Sony
81. [R1-2105327](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105327.zip) Joint channel estimation for PUSCH Samsung
82. [R1-2105394](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105394.zip) Discussion on joint channel estimation for PUSCH MediaTek Inc.
83. [R1-2105397](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105397.zip) Discussion on joint channel estimation for PUSCH Panasonic Corporation
84. [R1-2105490](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105490.zip) Discussions on joint channel estimation for PUSCH LG Electronics
85. [R1-2105509](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105509.zip) Design Considerations for Joint channel estimation for PUSCH Sierra Wireless, S.A.
86. [R1-2105577](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105577.zip) Joint channel estimation for PUSCH Xiaomi
87. [R1-2105642](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105642.zip) Joint channel estimation for multi-slot PUSCH Sharp
88. [R1-2105654](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105654.zip) Joint Channel Estimation for PUSCH Ericsson
89. [R1-2105713](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105713.zip) Joint channel estimation for PUSCH NTT DOCOMO, INC.
90. [R1-2105775](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105775.zip) Enhancements for joint channel estimation for multiple PUSCH Lenovo, Motorola Mobility
91. [R1-2105879](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105879.zip) Discussion on joint channel estimation for PUSCH WILUS Inc.
92. [R1-2105903](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105903.zip) Joint channel estimation for PUSCH coverage enhancements Nokia, Nokia Shanghai Bell
93. [R1-2104243](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2104243.zip) Discussion on PUCCH coverage enhancement Huawei, HiSilicon
94. [R1-2104333](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2104333.zip) Discussion on coverage enhancements for PUCCH ZTE
95. [R1-2104379](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2104379.zip) Discussion on PUCCH enhancements vivo
96. [R1-2104438](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2104438.zip) Discussion on PUCCH enhancements Spreadtrum Communications
97. [R1-2104540](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2104540.zip) Discussion on PUCCH enhancement CATT
98. [R1-2104628](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2104628.zip) Discussion on PUCCH enhancements CMCC
99. [R1-2104688](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2104688.zip) PUCCH enhancements Qualcomm Incorporated
100. [R1-2104795](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2104795.zip) PUCCH enhancements for coverage OPPO
101. [R1-2104849](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2104849.zip) Discussion on PUCCH enhancements China Telecom
102. [R1-2104862](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2104862.zip) Discussions on PUCCH enhancements InterDigital, Inc.
103. [R1-2104922](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2104922.zip) Discussion on PUCCH enhancements Intel Corporation
104. [R1-2105122](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105122.zip) PUCCH coverage enhancement Apple
105. [R1-2105149](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105149.zip) Discussion on PUCCH enhancement for NR coverage enhancement Panasonic Corporation
106. [R1-2105224](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105224.zip) PUCCH enhancements ETRI
107. [R1-2105257](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105257.zip) Discussion on PUCCH enhancements NEC
108. [R1-2105328](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105328.zip) PUCCH enhancements Samsung
109. [R1-2105491](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105491.zip) Discussions on coverage enhancement for PUCCH LG Electronics
110. [R1-2105578](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105578.zip) PUCCH coverage enhancement Xiaomi
111. [R1-2105643](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105643.zip) PUCCH coverage enhancement Sharp
112. [R1-2105655](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105655.zip) PUCCH Dynamic Repetition and DMRS Bundling Ericsson
113. [R1-2105714](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105714.zip) PUCCH enhancements NTT DOCOMO, INC.
114. [R1-2105776](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105776.zip) Enhancements for PUCCH repetition Lenovo, Motorola Mobility
115. [R1-2105904](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105904.zip) PUCCH coverage enhancements Nokia, Nokia Shanghai Bell
116. [R1-2104244](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2104244.zip) Msg3 repetition for coverage enhancement Huawei, HiSilicon
117. [R1-2104334](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2104334.zip) Discussion on support of Type A PUSCH repetitions for Msg3 ZTE
118. [R1-2104380](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2104380.zip) Discussion on Type A PUSCH repetitions for Msg3 vivo
119. [R1-2104439](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2104439.zip) Discussion on type A PUSCH repetitions for Msg3 Spreadtrum Communications
120. [R1-2104541](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2104541.zip) Discussion on Type A PUSCH repetitions for Msg3 CATT
121. [R1-2104629](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2104629.zip) Discussion on type A PUSCH repetitions for Msg3 CMCC
122. [R1-2104689](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2104689.zip) Type A PUSCH repetition for Msg3 Qualcomm Incorporated
123. [R1-2104796](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2104796.zip) Type A PUSCH repetitions for Msg3 coverage OPPO
124. [R1-2104850](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2104850.zip) Discussion on type A PUSCH repetitions for Msg3 China Telecom
125. [R1-2104863](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2104863.zip) Type A PUSCH repetitions for Msg3 InterDigital, Inc.
126. [R1-2104923](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2104923.zip) On Msg3 PUSCH repetition Intel Corporation
127. [R1-2105123](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105123.zip) Discussion on Msg3 Coverage Enhancement Apple
128. [R1-2105150](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105150.zip) Discussion on Type A PUSCH repetitions for Msg.3 Panasonic Corporation
129. [R1-2105225](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105225.zip) Type A PUSCH repetitions for Msg3 ETRI
130. [R1-2105329](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105329.zip) Type A PUSCH repetitions for Msg3 Samsung
131. [R1-2105492](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105492.zip) Discussion on coverage enhancement for Msg3 PUSCH LG Electronics
132. [R1-2105579](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105579.zip) Discussion on Type A PUSCH repetition for Msg3 Xiaomi
133. [R1-2105644](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105644.zip) Type A repetition for msg3 PUSCH Sharp
134. [R1-2105656](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105656.zip) Type A PUSCH Repetition for Msg3 Ericsson
135. [R1-2105715](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105715.zip) Type A PUSCH repetitions for Msg3 NTT DOCOMO, INC.
136. [R1-2105777](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105777.zip) Type A PUSCH repetitions for Msg3 Lenovo, Motorola Mobility
137. [R1-2105880](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105880.zip) Discussion on Type A PUSCH repetitions for Msg3 WILUS Inc.
138. [R1-2105905](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105905.zip) Approaches and solutions for Type A PUSCH repetitions for Msg3 Nokia, Nokia Shanghai Bell
139. [R1-2104335](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2104335.zip) Performance impacts of residual frequency error for joint channel estimation of PUSCH and PUCCH transmissions ZTE
140. [R1-2104381](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2104381.zip) Enhanced Contention resolution mechanism for CBRA procedure with MSG3 PUSCH repetition vivo
141. [R1-2104542](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2104542.zip) Views on reusing PUSCH enhancements for Msg3 CATT
142. [R1-2104797](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2104797.zip) Other considerations for coverage enhancement OPPO
143. [R1-2104864](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2104864.zip) Deterministic PUSCH repetition for coverage enhancements InterDigital, Inc.
144. [R1-2105330](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105330.zip) Discussion on PRACH enhancements for msg3 beam improvement Samsung
145. [R1-2105523](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105523.zip) Other issues for coverage enhancement Huawei, HiSilicon
146. [R1-2105657](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105657.zip) Other Coverage Enhancements for PUSCH Ericsson
147. [R1-2105906](file:///C%3A%5Cwanshic%5COneDrive%20-%20Qualcomm%5CDocuments%5CStandards%5C3GPP%20Standards%5CMeeting%20Documents%5CTSGR1_105%5CDocs%5CR1-2105906.zip) Implications of DMRS bundling for PUSCH and PUCCH Nokia, Nokia Shanghai Bell

RAN4 #98e-bis:

1. R4-2104580 Discussion on phase continuity and power consistency for UL repetition MediaTek inc.
2. R4-2104955 On non-zero gap between adjacent transmissions for PUCCH and PUSCH repetition China Telecom
3. R4-2105417 Reply LS on PUCCH and PUSCH repetition Qualcomm
4. R4-2105418 Way forward on phase continuity and power consistency for PUCCH and PUSCH repetition Huawei, HiSilicon
5. R4-2105477 Email discussion summary for [98-bis-e][140] NR\_cov\_enh Moderator (Huawei)
6. R4-2106918 Discussion on phase continuity for PUSCH and PUCCH repetitions InterDigital Communications
7. R4-2107273 on phase continuty for multiple transmissions HiSilicon Technologies Co. Ltd
8. R4-2107366 Phase continuity over the gap in tx Qualcomm Incorporated

RAN4 #99e:

1. R4-2108800 Phase continuity with the other channels in the gap Qualcomm Incorporated
2. R4-2109012 Views on phase continuity and power consistency for PUSCH and PUCCH repetition Sony
3. R4-2109263 Further discussion on phase continuity for LS reply InterDigital Communications
4. R4-2109581 On phase continuity and power consistency for PUCCH and PUSCH repetition China Telecom
5. R4-2109743 Phase continuity and power consistency for PUSCH and PUCCH repetition Nokia, Nokia Shanghai Bell
6. R4-2110611 Discussion on reply LS on NR coverage enhancement ZTE Corporation
7. R4-2110612 Discussion on phase discontinuity and power inconsistency tolerance across different repetitions ZTE Corporation
8. R4-2111156 Further analysis on PUSCH/PUCCH repetition impacts MediaTek Inc.
9. R4-2111194 Reply LS to RAN1 latest question on phase discontinuity Ericsson
10. R4-2111195 Simulation assumption for phase tolerance for PUSCH PUCCH repeition Ericsson
11. R4-2111385 on phase continuty for multiple transmissions Huawei, HiSilicon
12. R4-2111386 simulation assumption for phase tolerance Cov\_enh Huawei, HiSilicon
13. R4-2107880 Reply LS on PUCCH and PUSCH repetition Qualcomm Incorporated
14. R4-2107881 WF on phase continuity and power consistency for PUCCH and PUSCH repetition Huawei, HiSilicon
15. R4-2107957 Email discussion summary for [99-e][147] NR\_cov\_enh Moderator (China Telecom)