**3GPP TSG RAN WG1 Meeting #108-e R1-220xxxx**

**e-Meeting, November 11th – 19th, 2021**

**Agenda Item: 5.2**

**Source: Moderator (ZTE)**

**Title: RAN1 agreements for Rel-17 WI on SDT**

**Document for: Information**

Introduction

This contribution includes a list of RAN1 agreements made so far for the following Rel-17 WI. It also includes outgoing and incoming LS for information.

Title of WI: ‘NR small data transmissions in INACTIVE state’

WI code: NR\_SmallData\_INACTIVE

1. RAN1 Agreements

## RAN1#104e:

Agreement:

* From RAN1 perspective, at least a separate SearchSpace that is different from the existing common SearchSpace should be supported for monitoring the PDCCH addressed to the C-RNTI after successful completion of the RACH procedure during RA-SDT
	+ It is up to RAN2 decision if the separate SearchSpace is UE-specific or common to the UEs performing RA-SDT
* If the separate SearchSpace is not configured, type-1 PDCCH CSS can be reused.
* FFS UE-specific CORESET or common CORESET

Agreement:

* One or multiple SSBs can be associated with each CG configuration for CG-SDT.
* From RAN1 perspective, the following options can be considered for the association between the SSBs and the CG resources (including transmission occasions and DMRS) per CG configuration for CG-SDT.
	+ Opt. 1: Define the SSB-to-CG-PUSCH mapping rule
		- Reuse the SSB-to-RO mapping as the baseline
		- FFS the potential RAN1 impact, e.g. mapping ratio and association period
	+ Opt. 2: CG resources per CG configuration are associated with a set of SSB(s) by explicit signalling.
		- FFS the potential RAN1 impact
	+ Other solutions are not precluded
* FFS whether repetition is supported for CG-SDT or not, and if supported how to handle the mapping between the SSBs and repetitions
* FFS TA validation and PUSCH validation for CG-SDT.

RAN1#104bis-e:

**Conclusion:**

* It is RAN1’s common understanding that the CG configuration mechanism in licensed band can be reused for CG-SDT in principle.

Agreement:

* CG resources per CG configuration are associated with a set of SSB(s) configured by explicit signalling.
	+ FFS how to define an SSB-to-PUSCH resource mapping within the CG configuration.
	+ FFS specific changes to the CG configuration to support the additional SSB-to-PUSCH mapping, if any.

## RAN1#105e:

Agreement:

* The SSB-to-PUSCH resource mapping within the CG configuration is implicitly defined.
* The ordering of the SSB and CG PUSCH resources are to be captured in RAN1 spec.
	+ A PUSCH resource refers to a transmission occasion and a DMRS resource used for PUSCH transmission
	+ The ordering of the SSB can reuse from the SSB-to-RO mapping
	+ The ordering of CG PUSCH resources can reuse from that of MsgA PUSCH as much as possible
* FFS determination of mapping ratio and association period, e.g., explicitly signaled or implicitly derived
* FFS any limitation on the combination of the parameters for CG resources

Agreement:

* The SSB subset for RSRP based TA validation is determined at least based on a configured absolute RSRP threshold.
* FFS the SSB subset which could be
	+ within a set of SSBs configured per CG configuration
	+ or within a set of SSBs configured for all CG configurations
	+ or within a set of all SSBs actually transmitted as indicated in SIB1.
	+ or highest N SSBs that are measured to derive the subset for a UE across all CG configurations

## RAN1#106e:

**Conclusion**

RAN1 cannot reach consensus on the following options for the SSB subset for RSRP based TA validation. Ask RAN2 if they can do the down-selection.

1. Option 1: Within a set of SSBs configured per CG configuration
2. Option 2: Within a set of SSBs configured for all CG configurations
3. Option 3: Within a set of all SSBs actually transmitted as indicated in SIB1
4. Option 4: Highest N SSBs of all SSBs actually transmitted as indicated in SIB1

**Agreement**

* Each N of consecutive SSB indexes associated to one CG configuration are mapped to valid CG PUSCH resources
	+ first, in increasing order of DMRS resource indexes, where a DMRS resource index *DMRSid* is determined first in an ascending order of a DMRS port index and second in an ascending order of a DMRS sequence index
	+ second, in increasing order of CG period indexes in the association period
* The mapping ratio N is explicitly signalled and the association period is implicitly derived
	+ FFS candidate value set of mapping ratio, and whether it is configured per CG configuration or per cell
	+ The SSB to CG PUSCH association period is the duration of multiple of CG periods depending the smallest time duration in the set determined by the CG period such that all SSBs associated with the CG configuration are mapped at least once to CG PUSCH resources.
	+ An association pattern period includes one or more association periods and is determined so that a pattern between CG PUSCH occasions and SS/PBCH block indexes associated with the CG configuration repeats at most every 640 msec.
* Note: The mapping ordering and steps may be revisited if multiple CG PUSCH occasions in one CG period is supported

**Agreement**

Support multiple DMRS resources per CG configuration when single layer PUSCH transmission is assumed, and each DMRS resource could be mapped to the same or different SSB(s)

* FFS if multi-layer PUSCH transmission is supported for CG-SDT
* FFS any limitation on the DMRS configuration if multiple CG PUSCH occasions per CG period is supported

 **Agreement**

* The following PUSCH occasion validation rule is applied for CG-SDT
	+ for unpaired spectrum and for SS/PBCH blocks with indexes provided by ssb-PositionsInBurst in SIB1 or by ServingCellConfigCommon
		- if a UE is provided tdd-UL-DL-ConfigurationCommon, the valid PO is the PO in UL part in a slot, or at least Ngap symbols after the end of the DL part in a slot or after the end of the SSB in a slot
		- if a UE is not provided tdd-UL-DL-ConfigurationCommon, the valid PO does not precede a SS/PBCH block in the PUSCH slot, starts at least *Ngap* symbols after a last SS/PBCH block symbol
		- *Ngap* is provided in Table 8.1-2 in TS 38.213
	+ FFS if any validation rule following the CG-PUSCH in RRC connected state is applicable, and whether and how to handle the overlapping between CG-PUSCH occasions for CG-SDT and any valid PRACH occasion or MsgA PUSCH occasion.
* FFS the rule for paired spectrum, and whether/how to support CG-SDT for UEs operating in Type-A HD-FDD.

**Agreement:**

* For RA-SDT, when PRACH occasions are separate between SDT and non-SDT, PRACH resource configurations/parameters for 4-step RACH and/or 2-step RACH should be re-used as much as possible for 4-step RACH and/or 2-step RACH based SDT, respectively.
	+ Note: It is up to RAN2 discussion on the RO configuration for RA-SDT in separate ROs.
* For RA-SDT, when PRACH occasions are shared between SDT and non-SDT, at least following parameters can be configured, including 4-step RACH and/or 2-step RACH based SDT operation.
	+ Number of contention-based preambles for SDT per SSB per valid RO
	+ Note: whether starting position of the preambles for SDT per SSB per valid RO needs to be configured for RA-SDT in shared ROs is up to RAN2 discussion.
* **For RA-SDT, when PRACH occasions are shared between SDT and non-SDT, a PRACH mask can be configured to indicate a subset of ROs for RA-SDT.**
* For RA-SDT in shared ROs and separate ROs with non-SDT, the power control parameters follow those for non-SDT,
	+ i.e. preambleReceivedTargetPower and power ramping setting follow those for non-SDT.

**Conclusion:**

* Further discuss on the case when ROs are shared between SDT and non-SDT, but different RACH types have separate ROs after RAN2’s decision

**Agreement:**

* RAN1 confirms the RAN2 agreement that CG-SDT resource can be configured on initial BWP
	+ FFS whether CG-SDT resource can be configured on a separate BWP.

## RAN1#106bis-e:

**Agreement**

Multi-layer PUSCH transmission is not supported for CG-SDT.

**Agreement**

When SSB set indication is absent, UE assumes the SSB set includes all actually transmitted SSBs configured by SIB1.

**Agreement**

* RAN1 confirms that common PUCCH resources (i.e. those that are shared with non-SDT UEs) can also be used for HARQ-ACK feedback for Msg4 /MsgB and subsequent SDT transmissions.
* RAN1 thinks there is no need for any other PUCCH resources than common PUCCH resources shared with non-SDT UEs.

**Agreement**

BFD/BFR procedure is not required for SDT in Rel-17.

* FFS: whether or not to support reporting the beam change to gNB.

**Agreement**

For CG-SDT, the UE can assume the PDCCH carrying the DCI has the same DM-RS antenna port quasi co-location properties as for a SSB associated to the CG PUSCH transmission e.g. for detection of retransmission DCI in response to a CG PUSCH transmission.

**Conclusion**

No need to define UL/DL pattern type of validation rule specific for paired spectrum at least for non-RedCap UEs.

* FFS the case for RedCap UEs

**Conclusion**

It is RAN1’s common understanding that dynamic grant based retransmission has already been supported.

**Conclusion**

RA-SDT resource cannot be configured on non-initial BWP.

**Conclusion**

From RAN1’s perspective, there is no other L1 configuration for RA-SDT and CG-SDT to support subsequent data transmission.

**Agreement**

The pathloss for CG-SDT PUSCH power control can be determined by the measurement of selected SSB associated with the CG PUSCH.

**Conclusion**

* RAN1 cannot reach a consensus on whether to confirm RAN2 agreement that CG-SDT resource can be configured on separate SDT BWP.
* Capture the following in the LS: the concern is on the necessity.

**Conclusion**

* RAN1 cannot reach consensus on reusing CG-DFI mechanism for CG-SDT for operation in licensed band.

**Agreement**

* Mapping ratio of SSB to CG PUSCH is configured per CG configuration.
	+ FFS whether to restrict the same value for all CG configuration and/or allow different value for different CG configurations.
* For the candidate value set of SSB to CG PUSCH mapping ratio, support at least {1, 2, 4, 8, 16}
	+ FFS {1/8,1/4,1/2}

**Agreement**

* RAN1 confirms the working assumption in RAN2 that UE-specific search space is configured for UEs performing CG-SDT. This does not exclude the configuration of CSS for UEs performing CG-SDT.
* CORESET for UE performing RA-SDT should be a common CORESET.

**Agreement**

A CG PUSCH occasion is not valid if it overlaps with any valid PRACH occasion.

* FFS overlapping between CG PUSCH occasions and MsgA PUSCH occasion

## RAN1#107-e:

**Agreement**

* UE specific power control parameters P0 and alpha should be configured for initial UL transmission for CG-SDT
	+ Existing closed loop power control mechanism can be reused for re-transmission and subsequent data transmission.
* For RA-SDT power control parameters preambleReceivedTargetPower and powerRampingStep:
	+ For separate ROs, the power control parameters can be RA-SDT specific

**Agreement**

Separate common search space that can be configured for RA-SDT within the initial DL BWP can also be configured for CG-SDT.

**Conclusion**

No need to restrict the same value of mapping ratio for all CG configurations.

**Conclusion**

RAN1 cannot reach consensus on whether to support multiple CG occasions per CG period

* Note that the CG PUSCH with multiple DMRS is considered as one CG occasion.

**Conclusion**

During subsequent data transmission, no need to explicitly report beam to gNB.

**Conclusion**

RA-SDT and CG-SDT can be supported for RedCap UEs without considering specific optimization for Redcap, at least when RedCap UE share both the initial DL BWP and initial UL BWP with non-RedCap UEs.

**Agreement**

Reply LS on the physical layer aspects of small data transmission is endorsed in R1-2112782

## RAN1#108-e

**Agreement**

For CG-SDT, support mapping ratio {1/8, 1/4, 1/2} for SSB to CG PUSCH mapping.

**Agreement**

For CG-SDT, RAN1 cannot reach consensus on whether to support repetition or not, it’s up to RAN2 to decide on it.

**Agreement**

RAN1 confirms that the separate BWP in case of RedCap may still be considered as the initial BWP and SDT resources(both CG-SDT and RA-SDT) can hence be configured on this BWP for RedCap UEs.

* Note: details can be further studied to ensure proper functionality of RedCap UE performing SDT.

**Agreement**

* For CG-SDT, the starting time of association period is SFN0.
* Regarding the candidate value set of association period, adopt the Table 2.4-1
	+ FFS CG period smaller than 5ms
	+ Note: It does not mean to RAN2 the maximum CG period is 640ms. The table will be updated if RAN2 introduces other CG period values.
	+ Note: The potential impact on PDCCH monitoring periodicity should be considered if larger CG period value is introduced in RAN2

**Table 2.4-1: Mapping between CG period and SS/PBCH block to CG PUSCH resource association period**

|  |  |
| --- | --- |
| **CG period  (msec)** | **Association period (number of CG periods except when CG period is less than 5 ms)** |
| 5 | {1, 2, 4, 8,16, 32, 64, 128} |
| 8 | {1, 2, 4, 5, 8, 10, 16, 20, 40, 80} |
| 10 | {1, 2, 4, 8,16, 32, 64} |
| 16 | {1, 2, 4, 5, 8,10,20,40} |
| 20 | {1, 2, 4, 8,16, 32} |
| 32 | {1, 2, 4, 5, 10, 20} |
| 40 | {1, 2, 4, 8, 16} |
| 64 | {1, 2, 5, 10} |
| 80 | {1, 2, 4, 8} |
| 128 | {1, 5} |
| 160 | {1, 2, 4} |
| 320 | {1, 2} |
| 640 | {1 } |

**Agreement**

Introduce a new parameter e.g. sdt-DMRSports to configure the set of DMRS ports for SSB to PUSCH mapping

* Parameter antennaPort is not applicable to CG-SDT

Support up to 2 DMRS sequences for CG-SDT for CP-OFDM, the generation mechanism and configuration can reuse that of msgA PUSCH.

* Introduce a new parameter *sdt-NrofDMRS-Sequences* to configure 1 or 2 DMRS sequences.
* The description of parameter *dmrs-SeqInitialization* can be revised as “It’s present when single DMRS sequence is configured for CG-SDT”.

**Agreement**

Only single antenna port for single layer transmission is supported for CG-SDT

* *srs-ResourceIndicator* in *ConfiguredGrantConfig*is not applicable to CG-SDT.
* *precodingAndNumberOfLayers* in *ConfiguredGrantConfig*is always 1 for CG-SDT.

**Agreement**

* UE specific parameter *pucch-Config-r17* is not needed for SDT.
* RAN1 cannot reach consensus on the support of UE specific CORESET, UE specific parameters *pusch-Config-r17* and *pdsch-Config-r17*.

**Agreement**

* It’s up to RAN2 to decide on whether to support *uci-OnPUSCH* for CG-SDT.
* phy-PriorityIndex-r16 in ConfiguredGrantConfig is not applicable to CG-SDT.

**Agreement**

The reply LS to RAN2 on the physical layer aspects of small data transmission is endorsed in R1-2202656.

**Agreement**

The following TP is endorsed for the editor’s CR on TS38.213.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **------------------------------   TS 38.213-----------------------------------****< Unchanged text omitted >**19.1 Configured-grant based PUSCH transmission**< Unchanged text omitted >**An association period, starting from frame ~~TBD~~ SFN0, for mapping SS/PBCH block indexes, from the number of SS/PBCH block indexes, to valid PUSCH occasions and associated DM-RS resources is the smallest value in the set determined by the PUSCH configuration period provided by *periodicity*                         in *ConfiguredGrantConfig* according to Table xx such that SS/PBCH block indexes are mapped at least once to valid PUSCH occasions and associated DM-RS resources within the association period. A UE is provided a number of SS/PBCH block indexes associated with a PUSCH occasion and a DM-RS resource by *sdt-SSB-perCG-PUSCH*. If after an integer number of SS/PBCH block indexes to PUSCH occasions mapping cycles within the association period there is a set of PUSCH occasions that are not mapped to SS/PBCH block indexes, no SS/PBCH block indexes are mapped to the set of PUSCH occasions. An association pattern period includes one or more association periods and is determined so that a pattern between PUSCH occasions and SS/PBCH block indexes repeats at most every 640 msec. PUSCH occasions not associated with SS/PBCH block indexes after an integer number of association periods, if any, are not used for PUSCH transmissions.**< Unchanged text omitted >**Table xx: Mapping between PUSCH configuration period and SS/PBCH block to configured PUSCH resource association period

|  |  |
| --- | --- |
| PUSCH configuration period (msec) | Association period (number of PUSCH configuration periods except when PUSCH configuration period is less than 5 msec) |
| 5 | {1, 2, 4, 8,16, 32, 64, 128} |
| 8 | {1, 2, 4, 5, 8, 10, 16, 20, 40, 80} |
| 10 | {1, 2, 4, 8,16, 32, 64} |
| 16 | {1, 2, 4, 5, 8,10,20,40} |
| 20 | {1, 2, 4, 8,16, 32} |
| 32 | {1, 2, 4, 5, 10, 20} |
| 40 | {1, 2, 4, 8, 16} |
| 64 | {1, 2, 5, 10} |
| 80 | {1, 2, 4, 8} |
| 128 | {1, 5} |
| 160 | {1, 2, 4} |
| 320 | {1, 2} |
| 640 | {1 } |

**< Unchanged text omitted >** |

**Agreement**

Only fallback DCI is supported for CG-SDT.

**Agreement**

The following TP is endorsed for the editor’s CR on TS38.213.

|  |
| --- |
| **10.1 UE procedure for determining physical downlink control channel assignment** < Start of text proposal>For a DL BWP, if a UE is not provided *ra-SearchSpace* for Type1-PDCCH CSS set, the UE does not monitor PDCCH for Type1-PDCCH CSS set on the DL BWP. If the UE has not been provided a Type3-PDCCH CSS set or a USS set and the UE has received a C-RNTI and has been provided a Type1-PDCCH CSS set, the UE monitors PDCCH candidates for DCI format 0\_0 and DCI format 1\_0 with CRC scrambled by the C-RNTI in the Type1-PDCCH CSS set. If the UE has not been provided *sdt-SearchSpace* for Type1A-PDCCH CSS set or *sdt-CG-SearchSpace* for a USS set, the UE monitors PDCCH candidates for DCI format 0\_0 and DCI format 1\_0 with CRC scrambled by the C-RNTI in the Type1-PDCCH CSS set as described in clause 19.2.< End of text proposal> |

**Agreement**

The following TP is endorsed for the editor’s CR on TS38.213.

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| --- |
| **< Unchanged text omitted >**19.1 Configured-grant based PUSCH transmission**< Unchanged text omitted >**An association period, starting from frame TBD, for mapping SS/PBCH block indexes, from the number of SS/PBCH block indexes, to valid PUSCH occasions and associated DM-RS resources is the smallest value in the set determined by the PUSCH configuration period such that SS/PBCH block indexes are mapped at least once to valid PUSCH occasions and associated DM-RS resources within the association period. A UE is provided a number of SS/PBCH block indexes associated with a PUSCH occasion and a DM-RS resource by *sdt-SSB-perCG-PUSCH*. If after an integer number of SS/PBCH block indexes to PUSCH occasions and associated DMRS resources mapping cycles within the association period there is a set of PUSCH occasions and associated DMRS resources that are not mapped to SS/PBCH block indexes, no SS/PBCH block indexes are mapped to the set of PUSCH occasions and associated DMRS resources. An association pattern period includes one or more association periods and is determined so that a pattern between PUSCH occasions with associated DMRS resources and SS/PBCH block indexes repeats at most every 640 msec. PUSCH occasions and DMRS resources not associated with SS/PBCH block indexes after an integer number of association periods, if any, are not used for PUSCH transmissions.**< Unchanged text omitted >** |

**Agreement**

Non-consecutive SSB indexes are allowed to be configured in SSB subset for SSB to CG PUSCH mapping.

**Agreement**

The following TP is endorsed for the editor’s CR on TS38.211.

|  |
| --- |
| **------------------------------ TS 38.211-----------------------------------****< Unchanged text omitted >**6.4.1.1.1.1 Sequence generation when transform precoding is disabled**< Unchanged text omitted >**The quantity is- indicated by the DM-RS initialization field, if present, either in the DCI associated with the PUSCH transmission if DCI format 0\_1 or 0\_2, in [4, TS 38.212] is used;- indicated by the higher layer parameter *dmrs-SeqInitialization*, if present, for a Type 1 PUSCH transmission with a configured grant; - determined by the mapping between preamble(s) and a PUSCH occasion and the associated DMRS resource for a PUSCH transmission of Type-2 random access process in [5, TS 38.213];- determined by the mapping between SS/PBCH block(s) and a PUSCH occasion and the associated DMRS resource for a configured-grant based PUSCH transmission ~~with Type-1 configured grant~~ in RRC\_INACTIVE state [5, TS 38.213];- otherwise . |

**Agreement**

The following TP is endorsed for the editor’s CR on TS38.214.

|  |
| --- |
| **------------------------------ TS 38.214-----------------------------------****< Unchanged text omitted >**6.2.2 UE DM-RS transmission procedure**< Unchanged text omitted >**When transmitted PUSCH is scheduled by DCI format 0\_1 with CRC scrambled by C-RNTI, CS-RNTI, SP-CSI-RNTI or MCS-C-RNTI, or corresponding to a configured grant, or being a PUSCH for Type-2 random access procedure,- for a configured-grant based PUSCH transmission in RRC\_INACTIVE state ~~for PUSCH corresponding to a configured grant in absence of RRC connection~~, the UE is provided with a set of DM-RS port(s) by *sdt-DMRSports* ~~[~~*~~DMRS-UplinkConfig~~*~~s],~~. ~~and the DM-RS resource index is determined as defined~~ The DMRS port for the PUSCH is determined by the mapping between SS/PBCH block(s) and a PUSCH occasion and the associated DMRS resource as described in Clause 19.1 of [6, TS 38.213]. - the UE may be configured with higher layer parameter *dmrs-Type* in *DMRS-UplinkConfig*, and the configured DM-RS configuration type is used for transmitting PUSCH in as defined in Clause 6.4.1.1 of [4, TS 38.211]. **< Unchanged text omitted >** |

**Agreement**

For CG-SDT, UE transmits the PUCCH carrying HARQ-ACK feedback in response to a PDSCH with a same spatial domain transmission filter as a last ~~CG~~ PUSCH transmission.

**Agreement**

The following TP is endorsed for the editor’s CR on TS38.213.

|  |
| --- |
| **------------------------------ TS 38.213-----------------------------------****< Unchanged text omitted >**19.1 Configured-grant based PUSCH transmission**< Unchanged text omitted >**A UE can be provided a USS set by *sdt-CG-SearchSpace*, or a CSS set by *sdt-SearchSpace*, to monitor PDCCH for detection of DCI format 0\_0 with CRC scrambled by C-RNTI or CS-RNTI for scheduling PUSCH transmission or of DCI format 1\_0 with CRC scrambled by C-RNTI for scheduling PDSCH receptions [12, TS 38.331]. The UE may assume that the DM-RS antenna port associated with the PDCCH receptions, the DM-RS antenna port associated with the PDSCH receptions, and the SS/PBCH block associated with the PUSCH transmission are quasi co-located with respect to average gain and quasi co-location 'typeA' or 'typeD' properties. The UE transmits a PUCCH with HARQ-ACK information associated with the PDSCH receptions as described in clause 9.2.1, with a same spatial domain transmission filter ~~in a same active UL BWP~~ as the ~~latest~~ last PUSCH transmission.**< Unchanged text omitted >** |

**Agreement**

The validation rule defined for CG-SDT in FD-FDD mode can be reused for RedCap UE performing CG-SDT in HD-FDD mode.

**Agreement**

The following TP is endorsed for the editor’s CR on TS38.213.

|  |
| --- |
| **19.1 Configured-grant based PUSCH transmission**< Start of text proposal>~~Each~~ ~~consecutive~~ ~~number of~~ SS/PBCH block indexes are mapped to valid PUSCH occasions and associated DMRS resources in the following order.- first, in increasing order of DMRS resource indexes within a PUSCH occasion, where a DMRS resource index is determined first in an ascending order of a DMRS port index and second in an ascending order of a DMRS sequence index [4, TS 38.211]- second, in increasing order of PUSCH configuration period indexes< End of text proposal> |

1. Outgoing LS

RAN1#104e:

[R1-2102125](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_104-e/Docs/R1-2102125.zip) Reply LS on physical layer aspects of small data transmission RAN1, ZTE

RAN1#104bis-e:

[R1-2104012](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_104b-e/Docs/R1-2104012.zip) Reply LS on uplink timing alignment for small data transmissions RAN1, Lenovo

RAN1#105e:

[R1-2106309](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_105-e/Docs/R1-2106309.zip) LS on Beam correspondence with Small Data Transmission in Inactive State RAN1, Nokia

[R1-2106335](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_105-e/Docs/R1-2106335.zip) LS on the physical layer aspects of small data transmission RAN1, ZTE

RAN1#106e:

[R1-2108649](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_106-e/Docs/R1-2108649.zip) LS on the TA validation and mapping details for CG-SDT RAN1, ZTE

[R1-2108533](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_106-e/Docs/R1-2108533.zip) Reply LS on on physical layer aspects of small data transmission RAN1, vivo

RAN1#106bis-e:

[R1-2110661](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_106b-e/Docs/R1-2110661.zip) Reply LS on the physical layer aspects of small data transmission RAN1, ZTE

RAN1#107-e:

[R1-2112782](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_107-e/Inbox/R1-2112782.zip) Reply LS on the physical layer aspects of small data transmission RAN1, ZTE

RAN1#108-e

[R1-2202656](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_108-e/Inbox/R1-2202656.zip) Reply LS on the physical layer aspects of small data transmission RAN1, ZTE

1. Incoming LS

RAN1#104e:

[R1-2100025](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_104-e/Docs/R1-2100025.zip) LS on physical layer aspects of small data transmission RAN2, ZTE

RAN1#104bis-e:

[R1-2102286](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_104b-e/Docs/R1-2102286.zip) LS on uplink timing alignment for small data transmissions RAN2, Lenovo

RAN1#106e:

[R1-2106405](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_106-e/Docs/R1-2106405.zip) Reply LS to RAN1 on physical layer aspects of small data transmission RAN2, vivo

RAN1#106bis-e:

[R1-2108715](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_106b-e/Docs/R1-2108715.zip) LS on agreements related to SDT RAN2, ZTE

RAN1#107-e:

[R1-2112630](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_107-e/Inbox/R1-2112630.zip) Reply LS on the physical layer aspects of small data transmission RAN2, ZTE

RAN1#108-e

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