**3GPP TSG RAN Meeting #90e *RP-202570***

**Electronic Meeting, December 7 - 11, 2020**

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| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
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|  | **38.213** | **CR** | **0179** | **rev** | **1** | **Current version:** | **16.3.0** |  |
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| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
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| ***Proposed change affects:*** | UICC apps |  | ME | **x** | Radio Access Network | **x** | Core Network |  |

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| ***Title:***  | Correction on supplementary uplink in 38.213 |
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| ***Source to WG:*** | Huawei, HiSilicon |
| ***Source to TSG:*** | RAN1 |
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| ***Work item code:*** | NR\_newRAT-Core |  | ***Date:*** | 2020-12-11 |
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| ***Category:*** | **A** |  | ***Release:*** | Rel-16 |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)Rel-12 (Release 12)**Rel-13 (Release 13)Rel-14 (Release 14)Rel-15 (Release 15)Rel-16 (Release 16)* |
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| ***Reason for change:*** | The specifications define the determination of the valid slots for PUCCH repetition for paired and unpaired spectrum, but it is absent for supplementary uplink (SUL). Considering1) RAN#90e agreement: “No new signalling will be introduced in Rel-16 to provide a DL/UL configuration for an SUL carrier”; and2) no other NR or E-UTRA TDD operating band(s) are used within the frequency range of the SUL band in the same geographical area;the determination of valid slots for PUCCH repetition for supplementary uplink should follow the procedure for paired spectrum.The same correction for Rel-15 is in CR0164 (R1-2009625). |
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| ***Summary of change:*** | Clarify the determination of valid slots for PUCCH repetition for supplementary uplink.  |
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| ***Consequences if not approved:*** | Incomplete specification for supplementary uplink in case of PUCCH repetition |
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| ***Clauses affected:*** | 9.2.6 |
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|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **x** |  Other core specifications  | TS/TR ... CR ... |
| ***affected:*** |  | **x** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **x** |  O&M Specifications | TS/TR ... CR ...  |
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| ***Other comments:*** | **Isolated Impact Analysis:**This CR has isolated impact on supplementary uplink with respect to the determination of PUCCH repetition procedure. Since it is a straightforward specification correction for supplementary uplink, it is not expected to impact on gNB/UE implementation. |
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| ***This CR's revision history:*** |  |

**<Unchanged parts are omitted>**

9.2.6 PUCCH repetition procedure

For PUCCH formats 1, 3, or 4, a UE can be configured a number of slots, $N\_{PUCCH}^{repeat}$, for repetitions of a PUCCH transmission by respective *nrofSlots*. If a UE is provided a *PUCCH-config* that includes *subslotLengthForPUCCH-r16,* the UE does not expect the *PUCCH-config* to include *nrofSlots*.

For $N\_{PUCCH}^{repeat}>1$,

- the UE repeats the PUCCH transmission with the UCI over $N\_{PUCCH}^{repeat}$ slots

- a PUCCH transmission in each of the $N\_{PUCCH}^{repeat}$ slots has a same number of consecutive symbols, as provided by *nrofSymbols* in *PUCCH-format1*, *nrofSymbols* in *PUCCH-format3*, or *nrofSymbols* in *PUCCH-format4*

- a PUCCH transmission in each of the $N\_{PUCCH}^{repeat}$ slots has a same first symbol, as provided by *startingSymbolIndex* in *PUCCH-format1*, *startingSymbolIndex* in *PUCCH-format3*, or *startingSymbolIndex* in *PUCCH-format4*

- the UE is configured by *interslotFrequencyHopping* whether or not to perform frequency hopping for PUCCH transmissions in different slots

- if the UE is configured to perform frequency hopping for PUCCH transmissions across different slots

- the UE performs frequency hopping per slot

- the UE transmits the PUCCH starting from a first PRB, provided by *startingPRB*, in slots with even number and starting from the second PRB, provided by *secondHopPRB*, in slots with odd number. The slot indicated to the UE for the first PUCCH transmission has number 0 and each subsequent slot until the UE transmits the PUCCH in $N\_{PUCCH}^{repeat}$ slots is counted regardless of whether or not the UE transmits the PUCCH in the slot

- the UE does not expect to be configured to perform frequency hopping for a PUCCH transmission within a slot

- If the UE is not configured to perform frequency hopping for PUCCH transmissions across different slots and if the UE is configured to perform frequency hopping for a PUCCH transmission within a slot, the frequency hopping pattern between the first PRB and the second PRB is same within each slot

If the UE determines that, for a PUCCH transmission in a slot, the number of symbols available for the PUCCH transmission is smaller than the value provided by *nrofSymbols* for the corresponding PUCCH format, the UE does not transmit the PUCCH in the slot.

A SS/PBCH block symbol is a symbol of an SS/PBCH block with candidate SS/PBCH block index corresponding to the SS/PBCH block index indicated to a UE by *ssb-PositionsInBurst* in *SIB1* or *ssb-PositionsInBurst* in *ServingCellConfigCommon*, as described in Clause 4.1.

For unpaired spectrum, the UE determines the $N\_{PUCCH}^{repeat}$ slots for a PUCCH transmission starting from a slot indicated to the UE as described in Clause 9.2.3 for HARQ-ACK reporting, or a slot determined as described in Clause 9.2.4 for SR reporting or in Clause 5.2.1.4 of [6, TS 38.214] for CSI reporting and having

- an UL symbol, as described in Clause 11.1, or flexible symbol that is not SS/PBCH block symbol provided by *startingSymbolIndex* in *PUCCH-format1*, or in *PUCCH-format3*, or in *PUCCH-format4* as a first symbol, and

- consecutive UL symbols, as described in Clause 11.1, or flexible symbols that are not SS/PBCH block symbols, starting from the first symbol, equal to or larger than a number of symbols provided by *nrofsymbols* in *PUCCH-format1*, or in *PUCCH-format3*, or in *PUCCH-format4*

For paired spectrum or supplementary uplink band, the UE determines the $N\_{PUCCH}^{repeat}$ slots for a PUCCH transmission as the $N\_{PUCCH}^{repeat}$ consecutive slots starting from a slot indicated to the UE as described in Clause 9.2.3 for HARQ-ACK reporting, or a slot determined as described in Clause 9.2.4 for SR reporting or in Clause 5.2.1.4 of [6, TS 38.214] for CSI reporting.

If a UE would transmit a PUCCH over a first number $N\_{PUCCH}^{repeat}>1$ of slots and the UE would transmit a PUSCH with repetition Type A over a second number of slots, and the PUCCH transmission would overlap with the PUSCH transmission in one or more slots, and the conditions in Clause 9.2.5 for multiplexing the UCI in the PUSCH are satisfied in the overlapping slots, the UE transmits the PUCCH and does not transmit the PUSCH in the overlapping slots.

If a UE would transmit a PUCCH over a first number $N\_{PUCCH}^{repeat}>1$ of slots and the UE would transmit a PUSCH with repetition Type B over a second number of slots, and the PUCCH transmission would overlap with actual PUSCH repetitions in one or more slots, and the conditions in Clause 9.2.5 for multiplexing the UCI in the PUSCH are satisfied for the overlapping actual PUSCH repetitions, the UE transmits the PUCCH and does not transmit the overlapping actual PUSCH repetitions.

A UE does not multiplex different UCI types in a PUCCH transmission with repetitions over $N\_{PUCCH}^{repeat}>1$ slots. If a UE would transmit a first PUCCH over more than one slot and at least a second PUCCH over one or more slots, and the transmissions of the first PUCCH and the second PUCCH would overlap in a number of slots then, for each slot of the number of slots and with UCI type priority of HARQ-ACK > SR > CSI with higher priority > CSI with lower priority

- the UE does not expect the first PUCCH and any of the second PUCCHs to start at a same slot and include a UCI type with same priority

- if the first PUCCH and any of the second PUCCHs include a UCI type with same priority, the UE transmits the PUCCH starting at an earlier slot and does not transmit the PUCCH starting at a later slot

- if the first PUCCH and any of the second PUCCHs do not include a UCI type with same priority, the UE transmits the PUCCH that includes the UCI type with higher priority and does not transmit the PUCCH that include the UCI type with lower priority

A UE does not expect a PUCCH that is in response to a DCI format detection to overlap with any other PUCCH that does not satisfy the corresponding timing conditions in Clause 9.2.5.

If a UE would transmit a PUCCH over $N\_{PUCCH}^{repeat}$ slots and the UE does not transmit the PUCCH in a slot from the $N\_{PUCCH}^{repeat}$ slots due to overlapping with another PUCCH transmission in the slot, the UE counts the slot in the number of $N\_{PUCCH}^{repeat}$ slots.

**<Unchanged parts are omitted>**