**3GPP TSG-RAN2 Meeting # 131R2-250**

**Bengaluru, India, 25 – 29 August, 2025**

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| *CR-Form-v12.3* |
| **CHANGE REQUEST** |
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|  | **38.321** | **CR** |  | **rev** | **-** | **Current version:** | **18.6.0** |  |
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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 SP Positioning SRS frequency hopping |
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| ***Source to WG:*** | Huawei, HiSilicon, Ericsson |
| ***Source to TSG:*** | R2 |
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| ***Work item code:*** | NR\_pos-Core |  | ***Date:*** | 2025-08-25 |
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| ***Category:*** | **F** |  | ***Release:*** | Rel-18 |
|  | *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-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19) Rel-20 (Release 20)* |
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| ***Reason for change:*** | Since SP-SRS is supported for SP-SRS frequency hopping, it needs to be discussed how to support the activation/deactivation of the SP-SRS by the MAC CE. For the discussion in RAN1, 3 options have been provided

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| **Potential solutions discussed in RAN1**: * Option 1: Introduce a new MAC CE specifically for activating/deactivating positioning SRS frequency hopping.
* Option 2: Repurpose an existing field in the current SP positioning SRS MAC CE to indicate that the MAC CE is for activation/deactivating positioning SRS frequency hopping
* Option 3: When the UE is configured with positioning SRS frequency hopping the UE ignores the BWP ID field in the MAC CE.
	+ Note: this implies that for a CC, the UE can’t be configured with other positioning SRS (e.g., in a “regular” BWP) in the CC when it is configured with positioning SRS frequency hopping in the CC.
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Since the above 3 options remain in the summary after the discussion, we can assume that all of them are feasible/reasonable from technical point of view. In RAN2, we need to consider which options bring the least amount of spec impact; causing the least backward compatibility issues, while at the same time, provides full support for the feature. From our point of view, Option3 introduces the least impacts in terms of backward compatibility, which in the current phase is especially important. For this option, the following changes need to be made:- In MAC spec, it needs to be clarified that when a SP activation/deactivation MAC CE is received with the field *Positioning Resource Set’s cell ID* set to a cell where *srs-posTxHopping* is configured, the UE ignores the field *BWP-ID*- In RRC spec, it needs to be mentioned that if *srs-PosTxHopping* is configured under a certain uplink carrier, on the other UL BWPs of the uplink carrier, positioning SP-SRS resource set cannot be configured.  |
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| ***Summary of change:*** | Clarify in the field description for the field BWP ID within the SP Positioning SRS activation/deactivation MAC CE that when the UE receives the MAC CE for SP positioning SRS for frequency hopping, the UE ignores the field. **Impact analysis**Impacted functionality:SP positioning SRS frequency hoppingImpacted 5G architecture options:NR SAInter-operability:If the network is implemented according to the CR and the UE is not, it is possible that the UE applies the MAC CE’s indicaiton to the wrong BWP, which might result in positioning failure. If the UE is implemented according to the CR while the NW is not, there is no inter-op issue.  |
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| ***Consequences if not approved:*** | It is not possible for the current MAC CE for SP Positioning SRS activation/deactivation to be used for SP positioning SRS frequency hopping.  |
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| ***Clauses affected:*** | 6.1.3.36 |
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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:*** |  |
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| ***This CR's revision history:*** |  |

========================================FIRST CHANGE===============================

6.1.3.36 SP Positioning SRS Activation/Deactivation MAC CE

The SP Positioning SRS Activation/Deactivation MAC CE is identified by a MAC subheader with eLCID as specified in Table 6.2.1-1b. It has a variable size with following fields:

- A/D: This field indicates whether to activate or deactivate indicated SP Positioning SRS resource set. The field is set to 1 to indicate activation, otherwise it indicates deactivation;

- Positioning SRS Resource Set's Cell ID: This field indicates the identity of the Serving Cell, which contains activated/deactivated SP Positioning SRS Resource Set. If the MAC CE is used for activation/deactivation of the SP positioning SRS transmission in RRC\_INACTIVE, this field indicates the identity of the cell from where positioning SRS configuration was received. If the C field is set to 0, this field also indicates the identity of the Serving Cell which contains all resources indicated by the Spatial Relation for Resource IDi fields, if present. The length of the field is 5 bits;

- Positioning SRS Resource Set's BWP ID: This field indicates a UL BWP as the codepoint of the DCI *bandwidth part indicator* field as specified in TS 38.212 [9], which contains activated/deactivated SP Positioning SRS Resource Set. If the C field is set to 0, this field also indicates the identity of the BWP which contains all resources indicated by the Spatial Relation for Resource IDi fields, if present. If the MAC CE is used for activation/deactivation of the SP positioning SRS transmission in RRC\_INACTIVE and the SP positioning SRS is configured outside the initial BWP or if the MAC CE is used for activation/deactivation of SP positioning SRS for Tx frequency hopping, this field should be ignored by UE. The length of the field is 2 bits;

- C: This field indicates whether the octets containing Resource Serving Cell ID field(s) and Resource BWP ID field(s) within the field Spatial Relation for Resource ID i are present, except for Spatial Relation Resource IDi with DL-PRS or SSB. When A/D is set to 1, if this field is set to 1, the octets containing Resource Serving Cell ID field(s) and Resource BWP ID field(s) in the field Spatial Relation for Resource IDi are present, otherwise if this field is set to 0, they are not present. When A/D is set to 0, this field is always set to 0 that they are not present;

- SUL: This field indicates whether the MAC CE applies to the NUL carrier or SUL carrier configuration. This field is set to 1 to indicate that it applies to the SUL carrier configuration, and it is set to 0 to indicate that it applies to the NUL carrier configuration;

- Positioning SRS Resource Set ID: This field indicates the SP Positioning SRS Resource Set identified by *SRS-PosResourceSetId* as specified in TS 38.331 [5], which is to be activated or deactivated. The length of the field is 4 bits;

- Spatial Relation for Resource IDi: The field Spatial Relation for Resource IDi is only present if MAC CE is used for activation, i.e. the A/D field is set to 1. M is the total number of Positioning SRS resource(s) configured under the SP Positioning SRS resource set indicated by the field Positioning SRS Resource Set ID. There are 4 types of Spatial Relation for Resource IDi, which is indicated by the F (F0 and F1) field within. The fields within Spatial Relation for Resource IDi are shown in Figures 6.1.3.36-2 to 6.1.3.36-5 for the 4 types of Spatial Relations for Resource IDi;

- S: This field indicates whether the fields Spatial Relation for Resource IDi for the positioning SRS resource i within the positioning SRS resource set are present. If the field is set to 1, the fields Spatial Relation for Resource IDi are present; otherwise, they are absent;

- R: Reserved bit, set to 0.

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**Figure 6.1.3.36-1: SP Positioning SRS Activation/Deactivation MAC CE**

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**Figure 6.1.3.36-2: Spatial Relation for Resource IDi with NZP CSI-RS**

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**Figure 6.1.3.36-3: Spatial Relation for Resource IDi with SSB**

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**Figure 6.1.3.36-4: Spatial Relation for Resource IDi with SRS**

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**Figure 6.1.3.36-5: Spatial Relation for Resource IDi with DL-PRS**

The field Spatial Relation for Resource IDi consists of the following fields:

- F0: This field indicates the type of a resource used as a spatial relation for the ith Positioning SRS resource within the Positioning SRS Resource Set indicated with the field Positioning SRS Resource Set ID. The field is set to 00 to indicate NZP CSI-RS resource index is used; it is set to 01 to indicate SSB index is used; it is set to 10 to indicate SRS resource index is used; it is set to 11 to indicate DL-PRS index is used. The length of the field is 2 bits. When the MAC CE is used for SP SRS activation in RRC\_INACTIVE, the field should not be set to 00;

- F1: This field indicates the type of SRS resource used as spatial relation for the ith Positioning SRS resource within the SP Positioning SRS Resource Set indicated with the field Positioning SRS Resource Set ID when F0 is set to 10. The field is set to 0 to indicate SRS resource index *SRS-ResourceId* as defined in TS 38.331 [5] is used; the field is set to 1 to indicate Positioning SRS resource index *SRS-PosResourceId* as defined in TS 38.331 [5] is used;

- NZP CSI-RS Resource ID: This field contains an index of *NZP-CSI-RS-ResourceID*, as specified in TS 38.331 [5], indicating the NZP CSI-RS resource, which is used to derive the spatial relation for the positioning SRS. The length of the field is 8 bits;

- SSB index: This field contains an index of SSB *SSB-Index* as specified in TS 38.331 [5] and/or TS 37.355 [23]. The length of the field is 6 bits;

- PCI: This field contains physical cell identity *PhysCellId* as specified in TS 38.331 [5] and/or TS 37.355 [23]. The length of the field is 10 bits;

- SRS resource ID: When F1 is set to 0, the field indicates an index for SRS resource *SRS-ResourceId* as defined in TS 38.331 [5]; When F1 is set to 1, the field indicates an index for Positioning SRS resource *SRS-PosResourceId* as defined in TS 38.331 [5]. When the MAC CE is used for SP SRS activation in RRC\_INACTIVE, this field can only indicate an index for Positioning SRS resource *SRS-PosResourceId* configured in RRC\_INACTIVE. The length of the field is 5 bits representing the index from 0 to 31;

- E: This field indicates the extension of SRS resource ID as the MSB of SRS resource ID. The total length of the extended SRS resource ID is 6 bits. If E bit is set to 1, the SRS resource ID value is 5-bit SRS resource ID field + 32;

- DL-PRS Resource Set ID: This field contains an index for DL-PRS Resource Set *nr-DL-PRS-ResourceSetId* as defined in TS 37.355 [23]. The length of the field is 3 bits;

- DL-PRS Resource ID: This field contains an index for DL-PRS resource *nr-DL-PRS-Resource-Id* as defined in TS 37.355 [23]. The length of the field is 6 bits;

- DL-PRS ID: This field contains an identity for DL-PRS resource *dl-PRS-ID* as defined in TS 37.355 [23]. The length of the field is 8 bits;

- PI: This field indicates whether the field DL-PRS resource ID is present within the Spatial Relation for Resource IDi with DL-PRS. If the field is set to 1, the octet containing the field DL-PRS resource ID is present; otherwise, the octet is omitted;

- SI: This field indicates whether the field SSB index is present within the Spatial Relation for Resource IDi with SSB. If the field is set to 1, the octet containing the field SSB index is present; otherwise, the octet is omitted;

- Resource Serving Cell IDi: This field indicates the identity of the Serving Cell on which the resource used for spatial relationship derivation for the ith Positioning SRS resource is located. The length of the field is 5 bits;

- Resource BWP IDi: This field indicates a UL BWP as the codepoint of the DCI *bandwidth part indicator* field as specified in TS 38.212 [9], on which the resource used for spatial relationship derivation for the ith Positioning SRS resource is located. The length of the field is 2 bits.

=====================================END OF CHANGES============================