**3GPP TSG RAN WG1 #118 R1-24nnnnn**

**Maastricht, NL, August 19th – 23rd, 2024**

**Source: Ad-Hoc Chair (AT&T)**

**Title: Session Notes of AI 8.2.2**

**Agenda Item:** **8.2.2**

**Document for:** **Endorsement**

### 8.2.2 UE features for other Rel-18 work items (Topics B)

*Including UE features for NR MIMO, expanded and improved NR positioning, NES, mobility enhancement, NCR, IoT-NTN, NR-NTN, and BWP without restriction.*

**Agreement: Adopt the following changes highlighted in chromatic fonts, while keeping the yellow highlighting, if any, as shown**

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| 42. Netw\_Energy\_NR | 42-1 | Spatial domain adaptation with CSI feedback based on CSI report sub-configuration(s) for periodic CSI reporting | 1. Support of CSI feedback based on CSI report sub-configuration(s), each containing one port subset configuration/list of CSI-RS resource IDs for periodic CSI reporting  2. The max number of sub-configurations Lmax in one CSI report configuration  4. Supported maximum number of simultaneous NZP-CSI-RS resources per CC  5. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources per CC  6. Supported maximum number of simultaneous NZP-CSI-RS resources in active BWPs across all CCs  7. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources in active BWPs across all CCs  8. Support of single-panel type 1 codebook  9. Supported total number of periodic CSI reporting settings without sub-configurations plus the total number of sub-configurations across periodic CSI report settings with sub-configurations per BWP | ~~FFS~~ 2-35 | Yes |  | UE does not support spatial domain adaptation for periodicCSI reporting | Per band | No | No | N/A | Component 1 candidate values: {SD-type1, SD-type2, SD-type1and2}  Note: SD-type1 refers to configuration contains one port subset  Note: SD-type2 refers to configuration contains list of CSI-RS resource IDs  Component 2 candidate values: {2,3,4}  Component 4 candidate values: SD Type 1: {1, 2, 3 … 32} SD Type 2: {1, 2, 3 … 32}  Component 5 candidate values: SD Type 1: {8, 16, 24, … 128 } SD Type 2: {8, 16, 24, … 128 }  Component 6 candidate values: SD Type 1: {5, 6, 7, 8, 9, 10, 12, 14, 16, …, 62, 64} SD Type 2: {5, 6, 7, 8, 9, 10, 12, 14, 16, …, 62, 64}  Component 7 candidate value: SD Type 1: {8, 16, 24, …, 248, 256} SD Type 2: {8, 16, 24, …, 248, 256}  Component 9 candidate values: {2, 3, 4}  Note: Components 6 and 7 are signaled per BC  Note: For components 4~7 in FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2b and components 3~6 in FG 42-2a and 42-2c, NZP-CSI-RS resource and CSI-RS ports are counted for reporting settings with and without sub-configurations.  Note: If a UE reports more than one FG from FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c and if the UE is configured with CSI report settings with sub-configurations corresponding to a subset of the reported FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c, then the supported maximum of NZP-CSI-RS resources/ports is determined by the minimum of the reported values from that subset. | Optional with capability signaling |
| 42. Netw\_Energy\_NR | 42-1a | Spatial domain adaptation with CSI feedback based on CSI report sub-configuration(s) for semi-persistent CSI reporting on PUSCH | 1. Support of CSI feedback based on CSI report sub-configuration(s), each containing one port subset configuration/list of CSI-RS resource IDs for semi-persistent CSI reporting on PUSCH  2. The max number of sub-configurations Lmax in one CSI report configuration  3. Report of N CSI sub-report(s) included in one SP-CSI report where each CSI sub-report corresponds to one sub-configuration.  4. Supported maximum number of simultaneous NZP-CSI-RS resources per CC  5. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources per CC  6. Supported maximum number of simultaneous NZP-CSI-RS resources in active BWPs across all CCs  7. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources in active BWPs across all CCs  8. Support of single-panel type 1 codebook  9. Supported total number of semi-persistent CSI reporting settings without sub-configurations plus the total number of sub-configurations across semi-persistent CSI report settings with sub-configurations per BWP | ~~FFS~~ 2-35, 2-32b | Yes |  | UE does not support spatial domain adaptation for semi-persistent CSI reporting on PUSCH | Per band | No | No | N/A | Component 1 candidate values: {SD-type1, SD-type2, SD-type1and2}  Note: SD-type1 refers to configuration contains one port subset  Note: SD-type2 refers to configuration contains list of CSI-RS resource IDs  Component 2 candidate values: {2,3,4,5,6,7,8}  Component 3 candidate values: {2,3,4}  Component 4 candidate values: {1, 2, 3 … 32}  Component 5 candidate values: {8, 16, 24, … 128}  Component 6 candidate values: {5, 6, 7, 8, 9, 10, 12, 14, 16, …, 62, 64}  Component 7 candidate values: {8, 16, 24, …, 248, 256}  Component 9 candidate values: {2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12}  Note: Components 6 and 7 are signaled per BC  Note: For components 4~7 in FG42-1, 42-1a/b/c, 42-2, 42-2b and components 3~6 in FG42-2a/c, NZP-CSI-RS resource and CSI-RS ports are counted for reporting settings with and without sub-configurations.  Note: If a UE reports more than one FG from FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c and if the UE is configured with CSI report settings with sub-configurations corresponding to a subset of the reported FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c, then the supported maximum of NZP-CSI-RS resources/ports is determined by the minimum of the reported values from that subset.  Note: If a UE reports both FGs 42-1a and 42-1c and if the UE is configured with CSI report settings with sub-configurations corresponding to both FGs 42-1a and 42-1c, then the supported total number of semi-persistent CSI reporting settings without sub-configurations plus the total number of sub-configurations across semi-persistent CSI report settings with sub-configurations per BWP is determined by the minimum of the reported values from both FGs 42-1a and 42-1c. | Optional with capability signaling |
| 42. Netw\_Energy\_NR | 42-1c | Spatial domain adaptation with CSI feedback based on CSI report sub-configuration(s) for semi-persistent CSI reporting on PUCCH | 1. Support of CSI feedback based on CSI report sub-configuration(s), each containing one port subset configuration/list of CSI-RS resource IDs for semi-persistent CSI reporting on PUCCH  2. The max number of sub-configurations Lmax in one CSI report configuration  3. Report of N CSI sub-report(s) included in one SP-CSI report where each CSI sub-report corresponds to one sub-configuration.  4. Supported maximum number of simultaneous NZP-CSI-RS resources per CC  5. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources per CC  6. Supported maximum number of simultaneous NZP-CSI-RS resources in active BWPs across all CCs  7. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources in active BWPs across all CCs  8. Support of single-panel type 1 codebook  9. Supported total number of semi-persistent CSI reporting settings without sub-configurations plus the total number of sub-configurations across semi-persistent CSI report settings with sub-configurations per BWP | ~~FFS~~ 2-35, 2-32a | Yes |  | UE does not support spatial domain adaptation for semi-persistent CSI reporting on PUCCH | Per band | No | No | N/A | Component 1 candidate values: {SD-type1, SD-type2, SD-type1and2}  Note: SD-type1 refers to configuration contains one port subset  Note: SD-type2 refers to configuration contains list of CSI-RS resource IDs  Component 2 candidate values: {2,3,4}  Component 3 candidate values: {2,3,4}  Component 4 candidate values: {1, 2, 3 … 32}  Component 5 candidate values: {8, 16, 24, … 128}  Component 6 candidate values: {5, 6, 7, 8, 9, 10, 12, 14, 16, …, 62, 64}  Component 7 candidate values: {8, 16, 24, …, 248, 256}  Component 9 candidate values: {2, 3, 4}  Note: Components 6 and 7 are signaled per BC  Note: For components 4~7 in FG42-1, 42-1a/b/c, 42-2, 42-2b and components 3~6 in FG42-2a/c, NZP-CSI-RS resource and CSI-RS ports are counted for reporting settings with and without sub-configurations.    Note: If a UE reports more than one FG from FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c and if the UE is configured with CSI report settings with sub-configurations corresponding to a subset of the reported FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c, then the supported maximum of NZP-CSI-RS resources/ports is determined by the minimum of the reported values from that subset.  Note: If a UE reports both FGs 42-1a and 42-1c and if the UE is configured with CSI report settings with sub-configurations corresponding to both FGs 42-1a and 42-1c, then the supported total number of semi-persistent CSI reporting settings without sub-configurations plus the total number of sub-configurations across semi-persistent CSI report settings with sub-configurations per BWP is determined by the minimum of the reported values from both FGs 42-1a and 42-1c. | Optional with capability signaling |
| 42. Netw\_Energy\_NR | 42-1b | Spatial domain adaptation with CSI feedback based on CSI report sub-configuration(s) for aperiodic CSI reporting | 1. Support of CSI feedback based on CSI report sub-configuration(s), each containing one port subset configuration/list of CSI-RS resource IDs for aperiodic CSI reporting  2. The max number of sub-configurations Lmax in one CSI report configuration  3. Report of N CSI sub-report(s) included in one CSI report where each CSI sub-report corresponds to one sub-configuration  4. Supported maximum number of simultaneous NZP-CSI-RS resources per CC  5. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources per CC  6. Supported maximum number of simultaneous NZP-CSI-RS resources in active BWPs across all CCs  7. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources in active BWPs across all CCs  8. Support of single-panel type 1 codebook  9. Supported total number of aperiodic CSI reporting settings without sub-configurations plus the total number of sub-configurations across aperiodic CSI report settings with sub-configurations per BWP | ~~FFS~~ 2-35 | Yes |  | UE does not support spatial domain adaptation for aperiodic CSI reporting | Per band | No | No | N/A | Component 1 candidate values: {SD-type1, SD-type2, SD-type1and2}  Note: SD-type1 refers to configuration contains one port subset  Note: SD-type2 refers to configuration contains list of CSI-RS resource IDs  Component 2 candidate values: {2,3,4,5,6,7,8}  Component 3 candidate values {2,3,4}  Component 4 candidate values: SD Type 1: {1, 2, 3 … 32} SD Type 2: {1, 2, 3 … 32}  Component 5 candidate values:  SD Type 1: {8, 16, 24, … 128 } SD Type 2: {8, 16, 24, … 128 }  Component 6 candidate values:  SD Type 1: {5, 6, 7, 8, 9, 10, 12, 14, 16, …, 62, 64} SD Type 2: {5, 6, 7, 8, 9, 10, 12, 14, 16, …, 62, 64}  Component 7 candidate values:  SD Type 1: {8, 16, 24, …, 248, 256} SD Type 2: {8, 16, 24, …, 248, 256}  Note: Components 6 and 7 are signaled per BC  Component 9 candidate values: {2, 3, 4, 5, 6, 7, 8, 9, 10, 11,12}  Note: For components 4~7 in FG42-1, 42-1a/b/c, 42-2, 42-2b and components 3~6 in FG42-2a/c, NZP-CSI-RS resource and CSI-RS ports are counted for reporting settings with and without sub-configurations.  Note: If a UE reports more than one FG from FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c and if the UE is configured with CSI report settings with sub-configurations corresponding to a subset of the reported FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c, then the supported maximum of NZP-CSI-RS resources/ports is determined by the minimum of the reported values from that subset. | Optional with capability signaling |
| 42. Netw\_Energy\_NR | 42-2 | Power domain adaptation with CSI feedback based on CSI report sub-configuration(s) for periodic CSI reporting | 1. Support of CSI feedback based on CSI report sub-configuration(s), each containing one power offset for aperiodic CSI reporting  2. The max number of sub-configurations Lmax in one CSI report configuration  4. Supported maximum number of simultaneous NZP-CSI-RS resources per CC  5. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources per CC  6. Supported maximum number of simultaneous NZP-CSI-RS resources in active BWPs across all CCs  7. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources in active BWPs across all CCs  8. Support of single-panel type 1 codebook  9. Supported total number of periodic CSI reporting settings without sub-configurations plus the total number of sub-configurations across periodic CSI report settings with sub-configurations per BWP | ~~FFS~~ 2-35 | Yes |  | UE does not support power domain adaptation for periodicCSI reporting | Per band | No | No | N/A | Component 2 candidate value: {2,3,4}  Component 4 candidate value: {1, 2, 3 … 32}  Component 5 candidate value: {8, 16, 24, … 128 }  Component 6 candidate value: {5, 6, 7, 8, 9, 10, 12, 14, 16, …, 62, 64}  Component 7 candidate value: {8, 16, 24, …, 248, 256}  Note: Components 6 and 7 are signaled per BC  Component 9 candidate values: {2, 3, 4}  Note: For components 4~7 in FG42-1, 42-1a/b/c, 42-2, 42-2b and components 3~6 in FG42-2a/c, NZP-CSI-RS resource and CSI-RS ports are counted for reporting settings with and without sub-configurations.  Note: If a UE reports more than one FG from FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c and if the UE is configured with CSI report settings with sub-configurations corresponding to a subset of the reported FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c, then the supported maximum of NZP-CSI-RS resources/ports is determined by the minimum of the reported values from that subset. | Optional with capability signaling |
| 42. Netw\_Energy\_NR | 42-2a | Power domain adaptation with CSI feedback based on CSI report sub-configuration(s) for semi-persistent CSI reporting on PUSCH | Support of CSI feedback based on CSI report sub-configuration(s), each containing one power offset for semi-persistent CSI reporting  1. The max number of sub-configurations Lmax in one CSI report configuration on PUSCH  2. Report of N CSI sub-report(s) included in one SP-CSI report where each CSI sub-report corresponds to one sub-configuration.  3. Supported maximum number of simultaneous NZP-CSI-RS resources per CC  4. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources per CC  5. Supported maximum number of simultaneous NZP-CSI-RS resources in active BWPs across all CCs  6. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources in active BWPs across all CCs  7. Support of single-panel type 1 codebook  8. Supported total number of semi-persistent CSI reporting settings without sub-configurations plus the total number of sub-configurations across semi-persistent CSI report settings with sub-configurations per BWP | ~~FFS~~ 2-35, 2-32b | Yes |  | UE does not support power domain adaptation for semi-persistent CSI reporting on PUSCH | Per band | No | No | N/A | Component 1 candidate values: {2,3,4,5,6,7,8}  Component 2 candidate values: {2,3,4}  Component 3 candidate values: {1, 2, 3 … 32}  Component 4 candidate values: {8, 16, 24, … 128 }  Component 5 candidate values: {5, 6, 7, 8, 9, 10, 12, 14, 16, …, 62, 64}  Component 6 candidate values: {8, 16, 24, …, 248, 256}  Component 8 candidate values: {2, 3, 4,5,6,7,8,9,10,11,12}  Note: Components 5 and 6 are signaled per BC  Note: For components 4~7 in FG42-1, 42-1a/b/c, 42-2, 42-2b and components 3~6 in FG42-2a/c, NZP-CSI-RS resource and CSI-RS ports are counted for reporting settings with and without sub-configurations.  Note: If a UE reports more than one FG from FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c and if the UE is configured with CSI report settings with sub-configurations corresponding to a subset of the reported FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c, then the supported maximum of NZP-CSI-RS resources/ports is determined by the minimum of the reported values from that subset.  Note: If a UE reports both FGs 42-2a and 42-2c and if the UE is configured with CSI report settings with sub-configurations corresponding to both FGs 42-2a and 42-2c, then the supported total number of semi-persistent CSI reporting settings without sub-configurations plus the total number of sub-configurations across semi-persistent CSI report settings with sub-configurations per BWP is determined by the minimum of the reported values from both FGs 42-2a and 42-2c. | Optional with capability signaling |
| 42. Netw\_Energy\_NR | 42-2c | Power domain adaptation with CSI feedback based on CSI report sub-configuration(s) for semi-persistent CSI reporting on PUCCH | Support of CSI feedback based on CSI report sub-configuration(s), each containing one power offset for semi-persistent CSI reporting on PUCCH  1. The max number of sub-configurations Lmax in one CSI report configuration  2. Report of N CSI sub-report(s) included in one SP-CSI report where each CSI sub-report corresponds to one sub-configuration.  3. Supported maximum number of simultaneous NZP-CSI-RS resources per CC  4. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources per CC  5. Supported maximum number of simultaneous NZP-CSI-RS resources in active BWPs across all CCs  6. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources in active BWPs across all CCs  7. Support of single-panel type 1 codebook  8. Supported total number of semi-persistent CSI reporting settings without sub-configurations plus the total number of sub-configurations across semi-persistent CSI report settings with sub-configurations per BWP | ~~FFS~~ 2-35, 2-32a | Yes |  | UE does not support power domain adaptation for semi-persistent CSI reporting on PUCCH | Per band | No | No | N/A | Component 1 candidate values: {2,3,4}  Component 2 candidate values: {2,3,4}  Component 3 candidate values: {1, 2, 3 … 32}  Component 4 candidate values: {8, 16, 24, … 128}  Component 5 candidate values: {5, 6, 7, 8, 9, 10, 12, 14, 16, …, 62, 64}  Component 6 candidate values: {8, 16, 24, …, 248, 256}  Component 8 candidate values: {2, 3, 4}  Note: Components 5 and 6 are signaled per BC  Note: For components 4~7 in FG42-1, 42-1a/b/c, 42-2, 42-2b and components 3~6 in FG42-2a/c, NZP-CSI-RS resource and CSI-RS ports are counted for reporting settings with and without sub-configurations.  Note: If a UE reports more than one FG from FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c and if the UE is configured with CSI report settings with sub-configurations corresponding to a subset of the reported FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c, then the supported maximum of NZP-CSI-RS resources/ports is determined by the minimum of the reported values from that subset.  Note: If a UE reports both FGs 42-2a and 42-2c and if the UE is configured with CSI report settings with sub-configurations corresponding to both FGs 42-2a and 42-2c, then the supported total number of semi-persistent CSI reporting settings without sub-configurations plus the total number of sub-configurations across semi-persistent CSI report settings with sub-configurations per BWP is determined by the minimum of the reported values from both FGs 42-2a and 42-2c. | Optional with capability signaling |
| 42. Netw\_Energy\_NR | 42-2b | Power domain adaptation with CSI feedback based on CSI report sub-configuration(s) for aperiodic CSI reporting | 1. Support of CSI feedback based on CSI report sub-configuration(s), each containing one power offset for aperiodic CSI reporting  2. The max number of sub-configurations Lmax in one CSI report configuration  3. Report of N CSI sub-report(s) included in one CSI report where each CSI sub-report corresponds to one sub-configuration  4. Supported maximum number of simultaneous NZP-CSI-RS resources per CC  5. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources per CC  6. Supported maximum number of simultaneous NZP-CSI-RS resources in active BWPs across all CCs  7. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources in active BWPs across all CCs  8. Support of single-panel type 1 codebook  9. Supported total number of aperiodic CSI reporting settings without sub-configurations plus the total number of sub-configurations across aperiodic CSI report settings with sub-configurations per BWP | ~~FFS~~ 2-35 | Yes |  | UE does not support power domain adaptation for aperiodic CSI reporting | Per band | No | No | N/A | Component 2 candidate values: {2,3,4,5,6,7,8}  Component 3 candidate values: {2,3,4}  Component 4 candidate values: {1, 2, 3 … 32}  Component 5 candidate values: {8, 16, 24, … 128 }  Component 6 candidate values: {5, 6, 7, 8, 9, 10, 12, 14, 16, …, 62, 64}  Component 7 candidate values: {8, 16, 24, …, 248, 256}  Component 9 candidate values: {2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12}  Note: Components 6 and 7 are signaled per BC  Note: For components 4~7 in FG42-1, 42-1a/b/c, 42-2, 42-2b and components 3~6 in FG42-2a/c, NZP-CSI-RS resource and CSI-RS ports are counted for reporting settings with and without sub-configurations.  Note: If a UE reports more than one FG from FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c and if the UE is configured with CSI report settings with sub-configurations corresponding to a subset of the reported FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c, then the supported maximum of NZP-CSI-RS resources/ports is determined by the minimum of the reported values from that subset. | Optional with capability signaling |
| 42. Netw\_Energy\_NR | 42-8 | simultaneousCSI-SubReportsPerCC-r18 | Indicates the number of CSI report(s) for which the UE can measure and process reference signals simultaneously in a CC of the band for which this capability is provided. The CSI report comprises periodic, semi-persistent and aperiodic CSI and any latency classes and codebook types. The CSI report in *simultaneousCSI-SubReportsPerCC-r18* includes the beam report, and CSI report without sub-configurations plus CSI sub-report across CSI reports | ~~FFS~~ 2-35 | Yes |  | UE does not support spatial or power domain adaptation for CSI reporting | Per Band | No | No | N/A | Component 1 candidate values: {1, 2, 3, 4, 5, 6, 7, 8}  Note: UE shall report the value in this feature group being equal to or larger than that in *simultaneousCSI-ReportsPerCC*  Note: UE supporting at least one of FG 42-1/1a/1b/1c/2/2a/2b/2c shall report this FG | Optional with capability signaling |
| 42. Netw\_Energy\_NR | 42-9 | simultaneousCSI-SubReportsAllCC-r18 | Indicates whether the UE supports CSI report framework and the number of CSI report(s) which the UE can simultaneously process across all CCs, and across MCG and SCG in case of NR-DC. The CSI report comprises periodic, semi-persistent and aperiodic CSI and any latency classes and codebook types. The CSI report in *simultaneousCSI-SubReportsAllCC-r18* includes the beam report, and CSI report without sub-configurations plus CSI sub-report across CSI reports. This parameter may further limit *simultaneousCSI-SubReportsPerCC-r18* in MIMO-ParametersPerBand and Phy-ParametersFRX-Diff for each band in a given band combination | ~~FFS~~ 2-35 | Yes |  | UE does not support spatial or power domain adaptation for CSI reporting | Per BC | No | No | N/A | Component 1 candidate values: {5, 6, 7, ..., 32}  Note: UE shall report the value in this feature group being equal to or larger than that in *simultaneousCSI-ReportsAllCC*  Note: UE supporting at least one of FG 42-1/1a/1b/1c/2/2a/2b/2c shall report this FG | Optional with capability signaling |

**Agreement: Adopt the following changes highlighted in chromatic fonts, while keeping the yellow highlighting, if any, as shown**

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| 42. Netw\_Energy\_NR | 42-1 | Spatial domain adaptation with CSI feedback based on CSI report sub-configuration(s) for periodic CSI reporting | 1. Support of CSI feedback based on CSI report sub-configuration(s), each containing one port subset configuration/list of CSI-RS resource IDs for periodic CSI reporting  2. The max number of sub-configurations Lmax in one CSI report configuration  4. Supported maximum number of simultaneous NZP-CSI-RS resources per CC  5. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources per CC  6. Supported maximum number of simultaneous NZP-CSI-RS resources in active BWPs across all CCs  7. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources in active BWPs across all CCs  8. Support of single-panel type 1 codebook  9. Supported total number of periodic CSI reporting settings without sub-configurations plus the total number of sub-configurations across periodic CSI report settings with sub-configurations per BWP | FFS | Yes |  | UE does not support spatial domain adaptation for periodicCSI reporting | Per band | No | No | N/A | Component 1 candidate values: {SD-type1, SD-type2, SD-type1and2}  Note: SD-type1 refers to configuration contains one port subset  Note: SD-type2 refers to configuration contains list of CSI-RS resource IDs  Component 2 candidate values: {2,3,4}  Component 4 candidate values: SD Type 1: {1, 2, 3 … 32} SD Type 2: {1, 2, 3 … 32}  Component 5 candidate values: SD Type 1: {8, 16, 24, … 128 } SD Type 2: {8, 16, 24, … 128 }  Component 6 candidate values: SD Type 1: {5, 6, 7, 8, 9, 10, 12, 14, 16, …, 62, 64} SD Type 2: {5, 6, 7, 8, 9, 10, 12, 14, 16, …, 62, 64}  Component 7 candidate value: SD Type 1: {8, 16, 24, …, 248, 256} SD Type 2: {8, 16, 24, …, 248, 256}  Component 9 candidate values: {2, 3, 4}  Note: Components 6 and 7 are signaled per BC  Note: For components 4~7 in FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2b and components 3~6 in FG 42-2a and 42-2c, NZP-CSI-RS resource and CSI-RS ports are counted for reporting settings with and without sub-configurations.  Note: If a UE reports more than one FG from FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c and if the UE is configured with CSI report settings with sub-configurations corresponding to a subset of the reported FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c, then the supported maximum of NZP-CSI-RS resources/ports is determined by the minimum of the reported values from that subset.  Note: If a UE reports both FG 42-1 and FG 42-2, and if the UE is configured with CSI report settings with sub-configurations corresponding to both FG 42-1 and 42-2, then the supported total number of periodic CSI reporting settings without sub-configurations plus the total number of sub-configurations across periodic CSI report settings with sub-configurations per BWP is determined by the minimum of the reported values from both FGs 42-1 and 42-2. | Optional with capability signaling |
| 42. Netw\_Energy\_NR | 42-1b | Spatial domain adaptation with CSI feedback based on CSI report sub-configuration(s) for aperiodic CSI reporting | 1. Support of CSI feedback based on CSI report sub-configuration(s), each containing one port subset configuration/list of CSI-RS resource IDs for aperiodic CSI reporting  2. The max number of sub-configurations Lmax in one CSI report configuration  3. Report of N CSI sub-report(s) included in one CSI report where each CSI sub-report corresponds to one sub-configuration  4. Supported maximum number of simultaneous NZP-CSI-RS resources per CC  5. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources per CC  6. Supported maximum number of simultaneous NZP-CSI-RS resources in active BWPs across all CCs  7. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources in active BWPs across all CCs  8. Support of single-panel type 1 codebook  9. Supported total number of aperiodic CSI reporting settings without sub-configurations plus the total number of sub-configurations across aperiodic CSI report settings with sub-configurations per BWP | FFS | Yes |  | UE does not support spatial domain adaptation for aperiodic CSI reporting | Per band | No | No | N/A | Component 1 candidate values: {SD-type1, SD-type2, SD-type1and2}  Note: SD-type1 refers to configuration contains one port subset  Note: SD-type2 refers to configuration contains list of CSI-RS resource IDs  Component 2 candidate values: {2,3,4,5,6,7,8}  Component 3 candidate values {2,3,4}  Component 4 candidate values: SD Type 1: {1, 2, 3 … 32} SD Type 2: {1, 2, 3 … 32}  Component 5 candidate values:  SD Type 1: {8, 16, 24, … 128 } SD Type 2: {8, 16, 24, … 128 }  Component 6 candidate values:  SD Type 1: {5, 6, 7, 8, 9, 10, 12, 14, 16, …, 62, 64} SD Type 2: {5, 6, 7, 8, 9, 10, 12, 14, 16, …, 62, 64}  Component 7 candidate values:  SD Type 1: {8, 16, 24, …, 248, 256} SD Type 2: {8, 16, 24, …, 248, 256}  Note: Components 6 and 7 are signaled per BC  Component 9 candidate values: {2, 3, 4, 5, 6, 7, 8, 9, 10, 11,12}  Note: For components 4~7 in FG42-1, 42-1a/b/c, 42-2, 42-2b and components 3~6 in FG42-2a/c, NZP-CSI-RS resource and CSI-RS ports are counted for reporting settings with and without sub-configurations.  Note: If a UE reports more than one FG from FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c and if the UE is configured with CSI report settings with sub-configurations corresponding to a subset of the reported FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c, then the supported maximum of NZP-CSI-RS resources/ports is determined by the minimum of the reported values from that subset.  Note: If a UE reports both FGs 42-1b and FG 42-2b, and if the UE is configured with CSI report settings with sub-configurations corresponding to both FGs 42-1b and 42-2b, then the supported total number of aperiodic CSI reporting settings without sub-configurations plus the total number of sub-configurations across aperiodic CSI report settings with sub-configurations per BWP is determined by the minimum of the reported values from both FGs 42-1b and 42-2b. | Optional with capability signaling |
| 42. Netw\_Energy\_NR | 42-2 | Power domain adaptation with CSI feedback based on CSI report sub-configuration(s) for periodic CSI reporting | 1. Support of CSI feedback based on CSI report sub-configuration(s), each containing one power offset for aperiodic CSI reporting  2. The max number of sub-configurations Lmax in one CSI report configuration  4. Supported maximum number of simultaneous NZP-CSI-RS resources per CC  5. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources per CC  6. Supported maximum number of simultaneous NZP-CSI-RS resources in active BWPs across all CCs  7. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources in active BWPs across all CCs  8. Support of single-panel type 1 codebook  9. Supported total number of periodic CSI reporting settings without sub-configurations plus the total number of sub-configurations across periodic CSI report settings with sub-configurations per BWP | FFS | Yes |  | UE does not support power domain adaptation for periodicCSI reporting | Per band | No | No | N/A | Component 2 candidate value: {2,3,4}  Component 4 candidate value: {1, 2, 3 … 32}  Component 5 candidate value: {8, 16, 24, … 128 }  Component 6 candidate value: {5, 6, 7, 8, 9, 10, 12, 14, 16, …, 62, 64}  Component 7 candidate value: {8, 16, 24, …, 248, 256}  Note: Components 6 and 7 are signaled per BC  Component 9 candidate values: {2, 3, 4}  Note: For components 4~7 in FG42-1, 42-1a/b/c, 42-2, 42-2b and components 3~6 in FG42-2a/c, NZP-CSI-RS resource and CSI-RS ports are counted for reporting settings with and without sub-configurations.  Note: If a UE reports more than one FG from FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c and if the UE is configured with CSI report settings with sub-configurations corresponding to a subset of the reported FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c, then the supported maximum of NZP-CSI-RS resources/ports is determined by the minimum of the reported values from that subset.  Note: If a UE reports both FG 42-1 and FG 42-2, and if the UE is configured with CSI report settings with sub-configurations corresponding to both FG 42-1 and 42-2, then the supported total number of periodic CSI reporting settings without sub-configurations plus the total number of sub-configurations across periodic CSI report settings with sub-configurations per BWP is determined by the minimum of the reported values from both FGs 42-1 and 42-2. | Optional with capability signaling |
| 42. Netw\_Energy\_NR | 42-2b | Power domain adaptation with CSI feedback based on CSI report sub-configuration(s) for aperiodic CSI reporting | 1. Support of CSI feedback based on CSI report sub-configuration(s), each containing one power offset for aperiodic CSI reporting  2. The max number of sub-configurations Lmax in one CSI report configuration  3. Report of N CSI sub-report(s) included in one CSI report where each CSI sub-report corresponds to one sub-configuration  4. Supported maximum number of simultaneous NZP-CSI-RS resources per CC  5. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources per CC  6. Supported maximum number of simultaneous NZP-CSI-RS resources in active BWPs across all CCs  7. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources in active BWPs across all CCs  8. Support of single-panel type 1 codebook  9. Supported total number of aperiodic CSI reporting settings without sub-configurations plus the total number of sub-configurations across aperiodic CSI report settings with sub-configurations per BWP | FFS | Yes |  | UE does not support power domain adaptation for aperiodic CSI reporting | Per band | No | No | N/A | Component 2 candidate values: {2,3,4,5,6,7,8}  Component 3 candidate values: {2,3,4}  Component 4 candidate values: {1, 2, 3 … 32}  Component 5 candidate values: {8, 16, 24, … 128 }  Component 6 candidate values: {5, 6, 7, 8, 9, 10, 12, 14, 16, …, 62, 64}  Component 7 candidate values: {8, 16, 24, …, 248, 256}  Component 9 candidate values: {2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12}  Note: Components 6 and 7 are signaled per BC  Note: For components 4~7 in FG42-1, 42-1a/b/c, 42-2, 42-2b and components 3~6 in FG42-2a/c, NZP-CSI-RS resource and CSI-RS ports are counted for reporting settings with and without sub-configurations.  Note: If a UE reports more than one FG from FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c and if the UE is configured with CSI report settings with sub-configurations corresponding to a subset of the reported FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c, then the supported maximum of NZP-CSI-RS resources/ports is determined by the minimum of the reported values from that subset.  Note: If a UE reports both FGs 42-1b and FG 42-2b, and if the UE is configured with CSI report settings with sub-configurations corresponding to both FGs 42-1b and 42-2b, then the supported total number of aperiodic CSI reporting settings without sub-configurations plus the total number of sub-configurations across aperiodic CSI report settings with sub-configurations per BWP is determined by the minimum of the reported values from both FGs 42-1b and 42-2b. | Optional with capability signaling |

**Agreement: Adopt the following changes highlighted in chromatic fonts, while keeping the yellow highlighting, if any, as shown**

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| 42. Netw\_Energy\_NR | 42-1 | Spatial domain adaptation with CSI feedback based on CSI report sub-configuration(s) for periodic CSI reporting | 1. Support of CSI feedback based on CSI report sub-configuration(s), each containing one port subset configuration/list of CSI-RS resource IDs for periodic CSI reporting  2. The max number of sub-configurations Lmax in one CSI report configuration  4. Supported maximum number of simultaneous NZP-CSI-RS resources per CC  5. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources per CC  6. Supported maximum number of simultaneous NZP-CSI-RS resources in active BWPs across all CCs  7. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources in active BWPs across all CCs  8. Support of single-panel type 1 codebook  9. Supported total number of periodic CSI reporting settings without sub-configurations plus the total number of sub-configurations across periodic CSI report settings with sub-configurations per BWP | FFS | Yes |  | UE does not support spatial domain adaptation for periodicCSI reporting | Per band | No | No | N/A | Component 1 candidate values: {SD-type1, SD-type2, SD-type1and2}  Note: SD-type1 refers to all sub-configuration that contain~~s~~ one port subset  Note: SD-type2 refers to all sub-configuration that contain~~s~~ list of CSI-RS resource IDs  Component 2 candidate values: {2,3,4}  Component 4 candidate values: SD Type 1: {1, 2, 3 … 32} SD Type 2: {1, 2, 3 … 32}  Component 5 candidate values: SD Type 1: {8, 16, 24, … 128 } SD Type 2: {8, 16, 24, … 128 }  Component 6 candidate values: SD Type 1: {5, 6, 7, 8, 9, 10, 12, 14, 16, …, 62, 64} SD Type 2: {5, 6, 7, 8, 9, 10, 12, 14, 16, …, 62, 64}  Component 7 candidate value: SD Type 1: {8, 16, 24, …, 248, 256} SD Type 2: {8, 16, 24, …, 248, 256}  Component 9 candidate values: {2, 3, 4}  Note: Components 6 and 7 are signaled per BC  Note: For components 4~7 in FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2b and components 3~6 in FG 42-2a and 42-2c, NZP-CSI-RS resource and CSI-RS ports are counted for reporting settings with and without sub-configurations.  Note: If a UE reports more than one FG from FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c and if the UE is configured with CSI report settings with sub-configurations corresponding to a subset of the reported FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c, then the supported maximum of NZP-CSI-RS resources/ports is determined by the minimum of the reported values from that subset. | Optional with capability signaling |
| 42. Netw\_Energy\_NR | 42-1a | Spatial domain adaptation with CSI feedback based on CSI report sub-configuration(s) for semi-persistent CSI reporting on PUSCH | 1. Support of CSI feedback based on CSI report sub-configuration(s), each containing one port subset configuration/list of CSI-RS resource IDs for semi-persistent CSI reporting on PUSCH  2. The max number of sub-configurations Lmax in one CSI report configuration  3. Report of N CSI sub-report(s) included in one SP-CSI report where each CSI sub-report corresponds to one sub-configuration.  4. Supported maximum number of simultaneous NZP-CSI-RS resources per CC  5. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources per CC  6. Supported maximum number of simultaneous NZP-CSI-RS resources in active BWPs across all CCs  7. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources in active BWPs across all CCs  8. Support of single-panel type 1 codebook  9. Supported total number of semi-persistent CSI reporting settings without sub-configurations plus the total number of sub-configurations across semi-persistent CSI report settings with sub-configurations per BWP | FFS | Yes |  | UE does not support spatial domain adaptation for semi-persistent CSI reporting on PUSCH | Per band | No | No | N/A | Component 1 candidate values: {SD-type1, SD-type2, SD-type1and2}  Note: SD-type1 refers to all sub-configuration that contain~~s~~ one port subset  Note: SD-type2 refers to all sub-configuration that contain~~s~~ list of CSI-RS resource IDs  Component 2 candidate values: {2,3,4,5,6,7,8}  Component 3 candidate values: {2,3,4}  Component 4 candidate values: {1, 2, 3 … 32}  Component 5 candidate values: {8, 16, 24, … 128}  Component 6 candidate values: {5, 6, 7, 8, 9, 10, 12, 14, 16, …, 62, 64}  Component 7 candidate values: {8, 16, 24, …, 248, 256}  Component 9 candidate values: {2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12}  Note: Components 6 and 7 are signaled per BC  Note: For components 4~7 in FG42-1, 42-1a/b/c, 42-2, 42-2b and components 3~6 in FG42-2a/c, NZP-CSI-RS resource and CSI-RS ports are counted for reporting settings with and without sub-configurations.  Note: If a UE reports more than one FG from FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c and if the UE is configured with CSI report settings with sub-configurations corresponding to a subset of the reported FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c, then the supported maximum of NZP-CSI-RS resources/ports is determined by the minimum of the reported values from that subset.  Note: If a UE reports both FGs 42-1a and 42-1c and if the UE is configured with CSI report settings with sub-configurations corresponding to both FGs 42-1a and 42-1c, then the supported total number of semi-persistent CSI reporting settings without sub-configurations plus the total number of sub-configurations across semi-persistent CSI report settings with sub-configurations per BWP is determined by the minimum of the reported values from both FGs 42-1a and 42-1c. | Optional with capability signaling |
| 42. Netw\_Energy\_NR | 42-1c | Spatial domain adaptation with CSI feedback based on CSI report sub-configuration(s) for semi-persistent CSI reporting on PUCCH | 1. Support of CSI feedback based on CSI report sub-configuration(s), each containing one port subset configuration/list of CSI-RS resource IDs for semi-persistent CSI reporting on PUCCH  2. The max number of sub-configurations Lmax in one CSI report configuration  3. Report of N CSI sub-report(s) included in one SP-CSI report where each CSI sub-report corresponds to one sub-configuration.  4. Supported maximum number of simultaneous NZP-CSI-RS resources per CC  5. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources per CC  6. Supported maximum number of simultaneous NZP-CSI-RS resources in active BWPs across all CCs  7. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources in active BWPs across all CCs  8. Support of single-panel type 1 codebook  9. Supported total number of semi-persistent CSI reporting settings without sub-configurations plus the total number of sub-configurations across semi-persistent CSI report settings with sub-configurations per BWP | FFS | Yes |  | UE does not support spatial domain adaptation for semi-persistent CSI reporting on PUCCH | Per band | No | No | N/A | Component 1 candidate values: {SD-type1, SD-type2, SD-type1and2}  Note: SD-type1 refers to all sub-configuration that contain~~s~~ one port subset  Note: SD-type2 refers to all sub-configuration that contain~~s~~ list of CSI-RS resource IDs  Component 2 candidate values: {2,3,4}  Component 3 candidate values: {2,3,4}  Component 4 candidate values: {1, 2, 3 … 32}  Component 5 candidate values: {8, 16, 24, … 128}  Component 6 candidate values: {5, 6, 7, 8, 9, 10, 12, 14, 16, …, 62, 64}  Component 7 candidate values: {8, 16, 24, …, 248, 256}  Component 9 candidate values: {2, 3, 4}  Note: Components 6 and 7 are signaled per BC  Note: For components 4~7 in FG42-1, 42-1a/b/c, 42-2, 42-2b and components 3~6 in FG42-2a/c, NZP-CSI-RS resource and CSI-RS ports are counted for reporting settings with and without sub-configurations.    Note: If a UE reports more than one FG from FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c and if the UE is configured with CSI report settings with sub-configurations corresponding to a subset of the reported FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c, then the supported maximum of NZP-CSI-RS resources/ports is determined by the minimum of the reported values from that subset.  Note: If a UE reports both FGs 42-1a and 42-1c and if the UE is configured with CSI report settings with sub-configurations corresponding to both FGs 42-1a and 42-1c, then the supported total number of semi-persistent CSI reporting settings without sub-configurations plus the total number of sub-configurations across semi-persistent CSI report settings with sub-configurations per BWP is determined by the minimum of the reported values from both FGs 42-1a and 42-1c. | Optional with capability signaling |
| 42. Netw\_Energy\_NR | 42-1b | Spatial domain adaptation with CSI feedback based on CSI report sub-configuration(s) for aperiodic CSI reporting | 1. Support of CSI feedback based on CSI report sub-configuration(s), each containing one port subset configuration/list of CSI-RS resource IDs for aperiodic CSI reporting  2. The max number of sub-configurations Lmax in one CSI report configuration  3. Report of N CSI sub-report(s) included in one CSI report where each CSI sub-report corresponds to one sub-configuration  4. Supported maximum number of simultaneous NZP-CSI-RS resources per CC  5. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources per CC  6. Supported maximum number of simultaneous NZP-CSI-RS resources in active BWPs across all CCs  7. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources in active BWPs across all CCs  8. Support of single-panel type 1 codebook  9. Supported total number of aperiodic CSI reporting settings without sub-configurations plus the total number of sub-configurations across aperiodic CSI report settings with sub-configurations per BWP | FFS | Yes |  | UE does not support spatial domain adaptation for aperiodic CSI reporting | Per band | No | No | N/A | Component 1 candidate values: {SD-type1, SD-type2, SD-type1and2}  Note: SD-type1 refers to all sub-configuration that contain~~s~~ one port subset  Note: SD-type2 refers to all sub-configuration that contain~~s~~ list of CSI-RS resource IDs  Component 2 candidate values: {2,3,4,5,6,7,8}  Component 3 candidate values {2,3,4}  Component 4 candidate values: SD Type 1: {1, 2, 3 … 32} SD Type 2: {1, 2, 3 … 32}  Component 5 candidate values:  SD Type 1: {8, 16, 24, … 128 } SD Type 2: {8, 16, 24, … 128 }  Component 6 candidate values:  SD Type 1: {5, 6, 7, 8, 9, 10, 12, 14, 16, …, 62, 64} SD Type 2: {5, 6, 7, 8, 9, 10, 12, 14, 16, …, 62, 64}  Component 7 candidate values:  SD Type 1: {8, 16, 24, …, 248, 256} SD Type 2: {8, 16, 24, …, 248, 256}  Note: Components 6 and 7 are signaled per BC  Component 9 candidate values: {2, 3, 4, 5, 6, 7, 8, 9, 10, 11,12}  Note: For components 4~7 in FG42-1, 42-1a/b/c, 42-2, 42-2b and components 3~6 in FG42-2a/c, NZP-CSI-RS resource and CSI-RS ports are counted for reporting settings with and without sub-configurations.  Note: If a UE reports more than one FG from FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c and if the UE is configured with CSI report settings with sub-configurations corresponding to a subset of the reported FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c, then the supported maximum of NZP-CSI-RS resources/ports is determined by the minimum of the reported values from that subset. | Optional with capability signaling |

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**Agreement: With regards to FG 41-1-7a and FG 41-1-7b, consider the following options:**

* **Send an LS to RAN2 to inform them that this UE capability component has been specified, but there is no corresponding report specified in the ProvideLocationInformation message of TDOA and TOA methods.**

**Agreement: To address the absence of a number of ARP-IDs the device supports, introduce a new component in FG 41-1-19a:**

* **Change component 1 in FG 41-1-19a to “~~Support of~~ Maximum number of Rx ARP-IDs it supports”, with values {2,3,4}**
* **Change component 1 in FG 41-1-19b to “~~Support of~~ Maximum number of Tx ARP-IDs it supports”, with values {2,3,4}**

**Agreement: Adopt the following changes highlighted in chromatic fonts, while keeping the yellow highlighting, if any, as shown**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 42. Netw\_Energy\_NR | 42-1a | Spatial domain adaptation with CSI feedback based on CSI report sub-configuration(s) for semi-persistent CSI reporting on PUSCH | 1. Support of CSI feedback based on CSI report sub-configuration(s), each containing one port subset configuration/list of CSI-RS resource IDs for semi-persistent CSI reporting on PUSCH  2. The max number of sub-configurations Lmax in one CSI report configuration  3. Report of N CSI sub-report(s) included in one SP-CSI report where each CSI sub-report corresponds to one sub-configuration.  4. Supported maximum number of simultaneous NZP-CSI-RS resources per CC  5. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources per CC  6. Supported maximum number of simultaneous NZP-CSI-RS resources in active BWPs across all CCs  7. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources in active BWPs across all CCs  8. Support of single-panel type 1 codebook  9. Supported total number of semi-persistent CSI reporting settings without sub-configurations plus the total number of sub-configurations across semi-persistent CSI report settings with sub-configurations per BWP | 2-35, 2-32b | Yes |  | UE does not support spatial domain adaptation for semi-persistent CSI reporting on PUSCH | Per band | No | No | N/A | Component 1 candidate values: {SD-type1, SD-type2, SD-type1and2}  Note: SD-type1 refers to configuration contains one port subset  Note: SD-type2 refers to configuration contains list of CSI-RS resource IDs  Component 2 candidate values: {2,3,4,5,6,7,8}  Component 3 candidate values: {2,3,4}  Component 4 candidate values: {1, 2, 3 … 32}  Component 5 candidate values: {8, 16, 24, … 128}  Component 6 candidate values: {5, 6, 7, 8, 9, 10, 12, 14, 16, …, 62, 64}  Component 7 candidate values: {8, 16, 24, …, 248, 256}  Component 9 candidate values: {2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12}  Note: Components 6 and 7 are signaled per BC  Note: For components 4~7 in FG42-1, 42-1a/b/c, 42-2, 42-2b and components 3~6 in FG42-2a/c, NZP-CSI-RS resource and CSI-RS ports are counted for reporting settings with and without sub-configurations.  Note: If a UE reports more than one FG from FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c and if the UE is configured with CSI report settings with sub-configurations corresponding to a subset of the reported FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c, then the supported maximum of NZP-CSI-RS resources/ports is determined by the minimum of the reported values from that subset.  Note: If a UE reports ~~both~~ more than one FG from FGs 42-1a, FG 42-1c, FG 42-2a and 42-~~1~~2c and if the UE is configured with CSI report settings with sub-configurations corresponding to ~~both~~ a subset of the reported FG(s) ~~42-1a, FG 42-1c, FG 42-2a and 42-12c~~, then the supported total number of semi-persistent CSI reporting settings without sub-configurations plus the total number of sub-configurations across semi-persistent CSI report settings with sub-configurations per BWP is determined by the minimum of the reported values from that subset ~~both FGs 42-1a and 42-1c~~. | Optional with capability signaling |
| 42. Netw\_Energy\_NR | 42-1c | Spatial domain adaptation with CSI feedback based on CSI report sub-configuration(s) for semi-persistent CSI reporting on PUCCH | 1. Support of CSI feedback based on CSI report sub-configuration(s), each containing one port subset configuration/list of CSI-RS resource IDs for semi-persistent CSI reporting on PUCCH  2. The max number of sub-configurations Lmax in one CSI report configuration  3. Report of N CSI sub-report(s) included in one SP-CSI report where each CSI sub-report corresponds to one sub-configuration.  4. Supported maximum number of simultaneous NZP-CSI-RS resources per CC  5. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources per CC  6. Supported maximum number of simultaneous NZP-CSI-RS resources in active BWPs across all CCs  7. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources in active BWPs across all CCs  8. Support of single-panel type 1 codebook  9. Supported total number of semi-persistent CSI reporting settings without sub-configurations plus the total number of sub-configurations across semi-persistent CSI report settings with sub-configurations per BWP | 2-35, 2-32a | Yes |  | UE does not support spatial domain adaptation for semi-persistent CSI reporting on PUCCH | Per band | No | No | N/A | Component 1 candidate values: {SD-type1, SD-type2, SD-type1and2}  Note: SD-type1 refers to configuration contains one port subset  Note: SD-type2 refers to configuration contains list of CSI-RS resource IDs  Component 2 candidate values: {2,3,4}  Component 3 candidate values: {2,3,4}  Component 4 candidate values: {1, 2, 3 … 32}  Component 5 candidate values: {8, 16, 24, … 128}  Component 6 candidate values: {5, 6, 7, 8, 9, 10, 12, 14, 16, …, 62, 64}  Component 7 candidate values: {8, 16, 24, …, 248, 256}  Component 9 candidate values: {2, 3, 4}  Note: Components 6 and 7 are signaled per BC  Note: For components 4~7 in FG42-1, 42-1a/b/c, 42-2, 42-2b and components 3~6 in FG42-2a/c, NZP-CSI-RS resource and CSI-RS ports are counted for reporting settings with and without sub-configurations.    Note: If a UE reports more than one FG from FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c and if the UE is configured with CSI report settings with sub-configurations corresponding to a subset of the reported FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c, then the supported maximum of NZP-CSI-RS resources/ports is determined by the minimum of the reported values from that subset.  Note: If a UE reports ~~both~~ more than one FG from FGs 42-1a, FG 42-1c, FG 42-2a and 42-~~1~~2c and if the UE is configured with CSI report settings with sub-configurations corresponding to ~~both~~ a subset of the reported FG(s) ~~42-1a, FG 42-1c, FG 42-2a and 42-12c~~, then the supported total number of semi-persistent CSI reporting settings without sub-configurations plus the total number of sub-configurations across semi-persistent CSI report settings with sub-configurations per BWP is determined by the minimum of the reported values from that subset ~~both FGs 42-1a and 42-1c~~. | Optional with capability signaling |
| 42. Netw\_Energy\_NR | 42-2a | Power domain adaptation with CSI feedback based on CSI report sub-configuration(s) for semi-persistent CSI reporting on PUSCH | Support of CSI feedback based on CSI report sub-configuration(s), each containing one power offset for semi-persistent CSI reporting  1. The max number of sub-configurations Lmax in one CSI report configuration on PUSCH  2. Report of N CSI sub-report(s) included in one SP-CSI report where each CSI sub-report corresponds to one sub-configuration.  3. Supported maximum number of simultaneous NZP-CSI-RS resources per CC  4. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources per CC  5. Supported maximum number of simultaneous NZP-CSI-RS resources in active BWPs across all CCs  6. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources in active BWPs across all CCs  7. Support of single-panel type 1 codebook  8. Supported total number of semi-persistent CSI reporting settings without sub-configurations plus the total number of sub-configurations across semi-persistent CSI report settings with sub-configurations per BWP | 2-35, 2-32b | Yes |  | UE does not support power domain adaptation for semi-persistent CSI reporting on PUSCH | Per band | No | No | N/A | Component 1 candidate values: {2,3,4,5,6,7,8}  Component 2 candidate values: {2,3,4}  Component 3 candidate values: {1, 2, 3 … 32}  Component 4 candidate values: {8, 16, 24, … 128 }  Component 5 candidate values: {5, 6, 7, 8, 9, 10, 12, 14, 16, …, 62, 64}  Component 6 candidate values: {8, 16, 24, …, 248, 256}  Component 8 candidate values: {2, 3, 4,5,6,7,8,9,10,11,12}  Note: Components 5 and 6 are signaled per BC  Note: For components 4~7 in FG42-1, 42-1a/b/c, 42-2, 42-2b and components 3~6 in FG42-2a/c, NZP-CSI-RS resource and CSI-RS ports are counted for reporting settings with and without sub-configurations.  Note: If a UE reports more than one FG from FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c and if the UE is configured with CSI report settings with sub-configurations corresponding to a subset of the reported FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c, then the supported maximum of NZP-CSI-RS resources/ports is determined by the minimum of the reported values from that subset.  N Note: If a UE reports ~~both~~ more than one FG from FGs 42-1a, FG 42-1c, FG 42-2a and 42-~~1~~2c and if the UE is configured with CSI report settings with sub-configurations corresponding to ~~both~~ a subset of the reported FG(s) ~~42-1a, FG 42-1c, FG 42-2a and 42-12c~~, then the supported total number of semi-persistent CSI reporting settings without sub-configurations plus the total number of sub-configurations across semi-persistent CSI report settings with sub-configurations per BWP is determined by the minimum of the reported values from that subset ~~both FGs 42-1a and 42-1c~~. | Optional with capability signaling |
| 42. Netw\_Energy\_NR | 42-2c | Power domain adaptation with CSI feedback based on CSI report sub-configuration(s) for semi-persistent CSI reporting on PUCCH | Support of CSI feedback based on CSI report sub-configuration(s), each containing one power offset for semi-persistent CSI reporting on PUCCH  1. The max number of sub-configurations Lmax in one CSI report configuration  2. Report of N CSI sub-report(s) included in one SP-CSI report where each CSI sub-report corresponds to one sub-configuration.  3. Supported maximum number of simultaneous NZP-CSI-RS resources per CC  4. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources per CC  5. Supported maximum number of simultaneous NZP-CSI-RS resources in active BWPs across all CCs  6. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources in active BWPs across all CCs  7. Support of single-panel type 1 codebook  8. Supported total number of semi-persistent CSI reporting settings without sub-configurations plus the total number of sub-configurations across semi-persistent CSI report settings with sub-configurations per BWP | 2-35, 2-32a | Yes |  | UE does not support power domain adaptation for semi-persistent CSI reporting on PUCCH | Per band | No | No | N/A | Component 1 candidate values: {2,3,4}  Component 2 candidate values: {2,3,4}  Component 3 candidate values: {1, 2, 3 … 32}  Component 4 candidate values: {8, 16, 24, … 128}  Component 5 candidate values: {5, 6, 7, 8, 9, 10, 12, 14, 16, …, 62, 64}  Component 6 candidate values: {8, 16, 24, …, 248, 256}  Component 8 candidate values: {2, 3, 4}  Note: Components 5 and 6 are signaled per BC  Note: For components 4~7 in FG42-1, 42-1a/b/c, 42-2, 42-2b and components 3~6 in FG42-2a/c, NZP-CSI-RS resource and CSI-RS ports are counted for reporting settings with and without sub-configurations.  Note: If a UE reports more than one FG from FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c and if the UE is configured with CSI report settings with sub-configurations corresponding to a subset of the reported FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c, then the supported maximum of NZP-CSI-RS resources/ports is determined by the minimum of the reported values from that subset.  Note: If a UE reports ~~both~~ more than one FG from FGs 42-1a, FG 42-1c, FG 42-2a and 42-~~1~~2c and if the UE is configured with CSI report settings with sub-configurations corresponding to ~~both~~ a subset of the reported FG(s) ~~42-1a, FG 42-1c, FG 42-2a and 42-12c~~, then the supported total number of semi-persistent CSI reporting settings without sub-configurations plus the total number of sub-configurations across semi-persistent CSI report settings with sub-configurations per BWP is determined by the minimum of the reported values from that subset ~~both FGs 42-1a and 42-1c~~. | Optional with capability signaling |

**Agreement: Adopt the following changes highlighted in chromatic fonts, while keeping the yellow highlighting, if any, as shown**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 42. Netw\_Energy\_NR | 42-1 | Spatial domain adaptation with CSI feedback based on CSI report sub-configuration(s) for periodic CSI reporting | 1. Support of CSI feedback based on CSI report sub-configuration(s), each containing one port subset configuration/list of CSI-RS resource IDs for periodic CSI reporting  2. The max number of sub-configurations Lmax in one CSI report configuration  4. Supported maximum number of simultaneous NZP-CSI-RS resources per CC  5. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources per CC  6. Supported maximum number of simultaneous NZP-CSI-RS resources in active BWPs across all CCs  7. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources in active BWPs across all CCs  8. Support of single-panel type 1 codebook  9. Supported total number of periodic CSI reporting settings without sub-configurations plus the total number of sub-configurations across periodic CSI report settings with sub-configurations per BWP | 2-35 | Yes |  | UE does not support spatial domain adaptation for periodicCSI reporting | Per band | No | No | N/A | Component 1 candidate values: {SD-type1, SD-type2, SD-type1and2}  Note: SD-type1 refers to configuration contains one port subset  Note: SD-type2 refers to configuration contains list of CSI-RS resource IDs  Component 2 candidate values: {2,3,4}  Component 4 candidate values: SD Type 1: {1, 2, 3 … 32} SD Type 2: {1, 2, 3 … 32}  Component 5 candidate values: SD Type 1: {8, 16, 24, … 128 } SD Type 2: {8, 16, 24, … 128 }  Component 6 candidate values: SD Type 1: {5, 6, 7, 8, 9, 10, 12, 14, 16, …, 62, 64} SD Type 2: {5, 6, 7, 8, 9, 10, 12, 14, 16, …, 62, 64}  Component 7 candidate value: SD Type 1: {8, 16, 24, …, 248, 256} SD Type 2: {8, 16, 24, …, 248, 256}  Component 9 candidate values: {2, 3, 4}  Note: Components 6 and 7 are signaled per BC  Note: For components 4~7 in FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2b and components 3~6 in FG 42-2a and 42-2c, NZP-CSI-RS resource and CSI-RS ports are counted for reporting settings with and without sub-configurations.  Note: If a UE reports more than one FG from FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c and if the UE is configured with CSI report settings with sub-configurations corresponding to a subset of the reported FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c, then the supported maximum of NZP-CSI-RS resources/ports across all periodic, semi-persistent, aperiodic CSI report settings with sub-configurations corresponding to all of spatial and power domain adaptations and without sub-configurations is determined by the minimum of the reported values from that subset. | Optional with capability signaling |
| 42. Netw\_Energy\_NR | 42-1a | Spatial domain adaptation with CSI feedback based on CSI report sub-configuration(s) for semi-persistent CSI reporting on PUSCH | 1. Support of CSI feedback based on CSI report sub-configuration(s), each containing one port subset configuration/list of CSI-RS resource IDs for semi-persistent CSI reporting on PUSCH  2. The max number of sub-configurations Lmax in one CSI report configuration  3. Report of N CSI sub-report(s) included in one SP-CSI report where each CSI sub-report corresponds to one sub-configuration.  4. Supported maximum number of simultaneous NZP-CSI-RS resources per CC  5. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources per CC  6. Supported maximum number of simultaneous NZP-CSI-RS resources in active BWPs across all CCs  7. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources in active BWPs across all CCs  8. Support of single-panel type 1 codebook  9. Supported total number of semi-persistent CSI reporting settings without sub-configurations plus the total number of sub-configurations across semi-persistent CSI report settings with sub-configurations per BWP | 2-35, 2-32b | Yes |  | UE does not support spatial domain adaptation for semi-persistent CSI reporting on PUSCH | Per band | No | No | N/A | Component 1 candidate values: {SD-type1, SD-type2, SD-type1and2}  Note: SD-type1 refers to configuration contains one port subset  Note: SD-type2 refers to configuration contains list of CSI-RS resource IDs  Component 2 candidate values: {2,3,4,5,6,7,8}  Component 3 candidate values: {2,3,4}  Component 4 candidate values: {1, 2, 3 … 32}  Component 5 candidate values: {8, 16, 24, … 128}  Component 6 candidate values: {5, 6, 7, 8, 9, 10, 12, 14, 16, …, 62, 64}  Component 7 candidate values: {8, 16, 24, …, 248, 256}  Component 9 candidate values: {2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12}  Note: Components 6 and 7 are signaled per BC  Note: For components 4~7 in FG42-1, 42-1a/b/c, 42-2, 42-2b and components 3~6 in FG42-2a/c, NZP-CSI-RS resource and CSI-RS ports are counted for reporting settings with and without sub-configurations.  Note: If a UE reports more than one FG from FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c and if the UE is configured with CSI report settings with sub-configurations corresponding to a subset of the reported FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c, then the supported maximum of NZP-CSI-RS resources/ports across all periodic, semi-persistent, aperiodic CSI report settings with sub-configurations corresponding to all of spatial and power domain adaptations and without sub-configurations is determined by the minimum of the reported values from that subset.  Note: If a UE reports both FGs 42-1a and 42-1c and if the UE is configured with CSI report settings with sub-configurations corresponding to both FGs 42-1a and 42-1c, then the supported total number of semi-persistent CSI reporting settings without sub-configurations plus the total number of sub-configurations across semi-persistent CSI report settings with sub-configurations per BWP is determined by the minimum of the reported values from both FGs 42-1a and 42-1c. | Optional with capability signaling |
| 42. Netw\_Energy\_NR | 42-1c | Spatial domain adaptation with CSI feedback based on CSI report sub-configuration(s) for semi-persistent CSI reporting on PUCCH | 1. Support of CSI feedback based on CSI report sub-configuration(s), each containing one port subset configuration/list of CSI-RS resource IDs for semi-persistent CSI reporting on PUCCH  2. The max number of sub-configurations Lmax in one CSI report configuration  3. Report of N CSI sub-report(s) included in one SP-CSI report where each CSI sub-report corresponds to one sub-configuration.  4. Supported maximum number of simultaneous NZP-CSI-RS resources per CC  5. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources per CC  6. Supported maximum number of simultaneous NZP-CSI-RS resources in active BWPs across all CCs  7. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources in active BWPs across all CCs  8. Support of single-panel type 1 codebook  9. Supported total number of semi-persistent CSI reporting settings without sub-configurations plus the total number of sub-configurations across semi-persistent CSI report settings with sub-configurations per BWP | 2-35, 2-32a | Yes |  | UE does not support spatial domain adaptation for semi-persistent CSI reporting on PUCCH | Per band | No | No | N/A | Component 1 candidate values: {SD-type1, SD-type2, SD-type1and2}  Note: SD-type1 refers to configuration contains one port subset  Note: SD-type2 refers to configuration contains list of CSI-RS resource IDs  Component 2 candidate values: {2,3,4}  Component 3 candidate values: {2,3,4}  Component 4 candidate values: {1, 2, 3 … 32}  Component 5 candidate values: {8, 16, 24, … 128}  Component 6 candidate values: {5, 6, 7, 8, 9, 10, 12, 14, 16, …, 62, 64}  Component 7 candidate values: {8, 16, 24, …, 248, 256}  Component 9 candidate values: {2, 3, 4}  Note: Components 6 and 7 are signaled per BC  Note: For components 4~7 in FG42-1, 42-1a/b/c, 42-2, 42-2b and components 3~6 in FG42-2a/c, NZP-CSI-RS resource and CSI-RS ports are counted for reporting settings with and without sub-configurations.    Note: If a UE reports more than one FG from FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c and if the UE is configured with CSI report settings with sub-configurations corresponding to a subset of the reported FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c, then the supported maximum of NZP-CSI-RS resources/ports across all periodic, semi-persistent, aperiodic CSI report settings with sub-configurations corresponding to all of spatial and power domain adaptations and without sub-configurations is determined by the minimum of the reported values from that subset.  Note: If a UE reports both FGs 42-1a and 42-1c and if the UE is configured with CSI report settings with sub-configurations corresponding to both FGs 42-1a and 42-1c, then the supported total number of semi-persistent CSI reporting settings without sub-configurations plus the total number of sub-configurations across semi-persistent CSI report settings with sub-configurations per BWP is determined by the minimum of the reported values from both FGs 42-1a and 42-1c. | Optional with capability signaling |
| 42. Netw\_Energy\_NR | 42-1b | Spatial domain adaptation with CSI feedback based on CSI report sub-configuration(s) for aperiodic CSI reporting | 1. Support of CSI feedback based on CSI report sub-configuration(s), each containing one port subset configuration/list of CSI-RS resource IDs for aperiodic CSI reporting  2. The max number of sub-configurations Lmax in one CSI report configuration  3. Report of N CSI sub-report(s) included in one CSI report where each CSI sub-report corresponds to one sub-configuration  4. Supported maximum number of simultaneous NZP-CSI-RS resources per CC  5. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources per CC  6. Supported maximum number of simultaneous NZP-CSI-RS resources in active BWPs across all CCs  7. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources in active BWPs across all CCs  8. Support of single-panel type 1 codebook  9. Supported total number of aperiodic CSI reporting settings without sub-configurations plus the total number of sub-configurations across aperiodic CSI report settings with sub-configurations per BWP | 2-35 | Yes |  | UE does not support spatial domain adaptation for aperiodic CSI reporting | Per band | No | No | N/A | Component 1 candidate values: {SD-type1, SD-type2, SD-type1and2}  Note: SD-type1 refers to configuration contains one port subset  Note: SD-type2 refers to configuration contains list of CSI-RS resource IDs  Component 2 candidate values: {2,3,4,5,6,7,8}  Component 3 candidate values {2,3,4}  Component 4 candidate values: SD Type 1: {1, 2, 3 … 32} SD Type 2: {1, 2, 3 … 32}  Component 5 candidate values:  SD Type 1: {8, 16, 24, … 128 } SD Type 2: {8, 16, 24, … 128 }  Component 6 candidate values:  SD Type 1: {5, 6, 7, 8, 9, 10, 12, 14, 16, …, 62, 64} SD Type 2: {5, 6, 7, 8, 9, 10, 12, 14, 16, …, 62, 64}  Component 7 candidate values:  SD Type 1: {8, 16, 24, …, 248, 256} SD Type 2: {8, 16, 24, …, 248, 256}  Note: Components 6 and 7 are signaled per BC  Component 9 candidate values: {2, 3, 4, 5, 6, 7, 8, 9, 10, 11,12}  Note: For components 4~7 in FG42-1, 42-1a/b/c, 42-2, 42-2b and components 3~6 in FG42-2a/c, NZP-CSI-RS resource and CSI-RS ports are counted for reporting settings with and without sub-configurations.  Note: If a UE reports more than one FG from FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c and if the UE is configured with CSI report settings with sub-configurations corresponding to a subset of the reported FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c, then the supported maximum of NZP-CSI-RS resources/ports across all periodic, semi-persistent, aperiodic CSI report settings with sub-configurations corresponding to all of spatial and power domain adaptations and without sub-configurations is determined by the minimum of the reported values from that subset. | Optional with capability signaling |
| 42. Netw\_Energy\_NR | 42-2 | Power domain adaptation with CSI feedback based on CSI report sub-configuration(s) for periodic CSI reporting | 1. Support of CSI feedback based on CSI report sub-configuration(s), each containing one power offset for aperiodic CSI reporting  2. The max number of sub-configurations Lmax in one CSI report configuration  4. Supported maximum number of simultaneous NZP-CSI-RS resources per CC  5. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources per CC  6. Supported maximum number of simultaneous NZP-CSI-RS resources in active BWPs across all CCs  7. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources in active BWPs across all CCs  8. Support of single-panel type 1 codebook  9. Supported total number of periodic CSI reporting settings without sub-configurations plus the total number of sub-configurations across periodic CSI report settings with sub-configurations per BWP | 2-35 | Yes |  | UE does not support power domain adaptation for periodicCSI reporting | Per band | No | No | N/A | Component 2 candidate value: {2,3,4}  Component 4 candidate value: {1, 2, 3 … 32}  Component 5 candidate value: {8, 16, 24, … 128 }  Component 6 candidate value: {5, 6, 7, 8, 9, 10, 12, 14, 16, …, 62, 64}  Component 7 candidate value: {8, 16, 24, …, 248, 256}  Note: Components 6 and 7 are signaled per BC  Component 9 candidate values: {2, 3, 4}  Note: For components 4~7 in FG42-1, 42-1a/b/c, 42-2, 42-2b and components 3~6 in FG42-2a/c, NZP-CSI-RS resource and CSI-RS ports are counted for reporting settings with and without sub-configurations.  Note: If a UE reports more than one FG from FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c and if the UE is configured with CSI report settings with sub-configurations corresponding to a subset of the reported FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c, then the supported maximum of NZP-CSI-RS resources/ports across all periodic, semi-persistent, aperiodic CSI report settings with sub-configurations corresponding to all of spatial and power domain adaptations and without sub-configurations is determined by the minimum of the reported values from that subset. | Optional with capability signaling |
| 42. Netw\_Energy\_NR | 42-2a | Power domain adaptation with CSI feedback based on CSI report sub-configuration(s) for semi-persistent CSI reporting on PUSCH | Support of CSI feedback based on CSI report sub-configuration(s), each containing one power offset for semi-persistent CSI reporting  1. The max number of sub-configurations Lmax in one CSI report configuration on PUSCH  2. Report of N CSI sub-report(s) included in one SP-CSI report where each CSI sub-report corresponds to one sub-configuration.  3. Supported maximum number of simultaneous NZP-CSI-RS resources per CC  4. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources per CC  5. Supported maximum number of simultaneous NZP-CSI-RS resources in active BWPs across all CCs  6. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources in active BWPs across all CCs  7. Support of single-panel type 1 codebook  8. Supported total number of semi-persistent CSI reporting settings without sub-configurations plus the total number of sub-configurations across semi-persistent CSI report settings with sub-configurations per BWP | 2-35, 2-32b | Yes |  | UE does not support power domain adaptation for semi-persistent CSI reporting on PUSCH | Per band | No | No | N/A | Component 1 candidate values: {2,3,4,5,6,7,8}  Component 2 candidate values: {2,3,4}  Component 3 candidate values: {1, 2, 3 … 32}  Component 4 candidate values: {8, 16, 24, … 128 }  Component 5 candidate values: {5, 6, 7, 8, 9, 10, 12, 14, 16, …, 62, 64}  Component 6 candidate values: {8, 16, 24, …, 248, 256}  Component 8 candidate values: {2, 3, 4,5,6,7,8,9,10,11,12}  Note: Components 5 and 6 are signaled per BC  Note: For components 4~7 in FG42-1, 42-1a/b/c, 42-2, 42-2b and components 3~6 in FG42-2a/c, NZP-CSI-RS resource and CSI-RS ports are counted for reporting settings with and without sub-configurations.  Note: If a UE reports more than one FG from FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c and if the UE is configured with CSI report settings with sub-configurations corresponding to a subset of the reported FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c, then the supported maximum of NZP-CSI-RS resources/ports across all periodic, semi-persistent, aperiodic CSI report settings with sub-configurations corresponding to all of spatial and power domain adaptations and without sub-configurations is determined by the minimum of the reported values from that subset.  Note: If a UE reports both FGs 42-2a and 42-2c and if the UE is configured with CSI report settings with sub-configurations corresponding to both FGs 42-2a and 42-2c, then the supported total number of semi-persistent CSI reporting settings without sub-configurations plus the total number of sub-configurations across semi-persistent CSI report settings with sub-configurations per BWP is determined by the minimum of the reported values from both FGs 42-2a and 42-2c. | Optional with capability signaling |
| 42. Netw\_Energy\_NR | 42-2c | Power domain adaptation with CSI feedback based on CSI report sub-configuration(s) for semi-persistent CSI reporting on PUCCH | Support of CSI feedback based on CSI report sub-configuration(s), each containing one power offset for semi-persistent CSI reporting on PUCCH  1. The max number of sub-configurations Lmax in one CSI report configuration  2. Report of N CSI sub-report(s) included in one SP-CSI report where each CSI sub-report corresponds to one sub-configuration.  3. Supported maximum number of simultaneous NZP-CSI-RS resources per CC  4. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources per CC  5. Supported maximum number of simultaneous NZP-CSI-RS resources in active BWPs across all CCs  6. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources in active BWPs across all CCs  7. Support of single-panel type 1 codebook  8. Supported total number of semi-persistent CSI reporting settings without sub-configurations plus the total number of sub-configurations across semi-persistent CSI report settings with sub-configurations per BWP | 2-35, 2-32a | Yes |  | UE does not support power domain adaptation for semi-persistent CSI reporting on PUCCH | Per band | No | No | N/A | Component 1 candidate values: {2,3,4}  Component 2 candidate values: {2,3,4}  Component 3 candidate values: {1, 2, 3 … 32}  Component 4 candidate values: {8, 16, 24, … 128}  Component 5 candidate values: {5, 6, 7, 8, 9, 10, 12, 14, 16, …, 62, 64}  Component 6 candidate values: {8, 16, 24, …, 248, 256}  Component 8 candidate values: {2, 3, 4}  Note: Components 5 and 6 are signaled per BC  Note: For components 4~7 in FG42-1, 42-1a/b/c, 42-2, 42-2b and components 3~6 in FG42-2a/c, NZP-CSI-RS resource and CSI-RS ports are counted for reporting settings with and without sub-configurations.  Note: If a UE reports more than one FG from FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c and if the UE is configured with CSI report settings with sub-configurations corresponding to a subset of the reported FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c, then the supported maximum of NZP-CSI-RS resources/ports across all periodic, semi-persistent, aperiodic CSI report settings with sub-configurations corresponding to all of spatial and power domain adaptations and without sub-configurations is determined by the minimum of the reported values from that subset.  Note: If a UE reports both FGs 42-2a and 42-2c and if the UE is configured with CSI report settings with sub-configurations corresponding to both FGs 42-2a and 42-2c, then the supported total number of semi-persistent CSI reporting settings without sub-configurations plus the total number of sub-configurations across semi-persistent CSI report settings with sub-configurations per BWP is determined by the minimum of the reported values from both FGs 42-2a and 42-2c. | Optional with capability signaling |
| 42. Netw\_Energy\_NR | 42-2b | Power domain adaptation with CSI feedback based on CSI report sub-configuration(s) for aperiodic CSI reporting | 1. Support of CSI feedback based on CSI report sub-configuration(s), each containing one power offset for aperiodic CSI reporting  2. The max number of sub-configurations Lmax in one CSI report configuration  3. Report of N CSI sub-report(s) included in one CSI report where each CSI sub-report corresponds to one sub-configuration  4. Supported maximum number of simultaneous NZP-CSI-RS resources per CC  5. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources per CC  6. Supported maximum number of simultaneous NZP-CSI-RS resources in active BWPs across all CCs  7. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources in active BWPs across all CCs  8. Support of single-panel type 1 codebook  9. Supported total number of aperiodic CSI reporting settings without sub-configurations plus the total number of sub-configurations across aperiodic CSI report settings with sub-configurations per BWP | 2-35 | Yes |  | UE does not support power domain adaptation for aperiodic CSI reporting | Per band | No | No | N/A | Component 2 candidate values: {2,3,4,5,6,7,8}  Component 3 candidate values: {2,3,4}  Component 4 candidate values: {1, 2, 3 … 32}  Component 5 candidate values: {8, 16, 24, … 128 }  Component 6 candidate values: {5, 6, 7, 8, 9, 10, 12, 14, 16, …, 62, 64}  Component 7 candidate values: {8, 16, 24, …, 248, 256}  Component 9 candidate values: {2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12}  Note: Components 6 and 7 are signaled per BC  Note: For components 4~7 in FG42-1, 42-1a/b/c, 42-2, 42-2b and components 3~6 in FG42-2a/c, NZP-CSI-RS resource and CSI-RS ports are counted for reporting settings with and without sub-configurations.  Note: If a UE reports more than one FG from FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c and if the UE is configured with CSI report settings with sub-configurations corresponding to a subset of the reported FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c, then the supported maximum of NZP-CSI-RS resources/ports across all periodic, semi-persistent, aperiodic CSI report settings with sub-configurations corresponding to all of spatial and power domain adaptations and without sub-configurations is determined by the minimum of the reported values from that subset. | Optional with capability signaling |

**Agreement: Adopt the following changes highlighted in chromatic fonts, while keeping the yellow highlighting, if any, as shown**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 2. IoT\_NTN\_enh | 2-4a | GNSS position fix in RRC Connected state for eMTC—autonomous | 1. UE re-acquires GNSS autonomously (when configured by the network) if it does not receive eNB GNSS measurement trigger  2. UE reports GNSS position fix time duration for measurement at least during the initial access stage and in connected mode via RRCConnectionReestablishmentComplete and RRCConnectionReconfigurationComplete for HO case  3. UE reports the remaining GNSS validity duration with MAC CE in connected mode | ~~[Rel. 18 2-3a,]~~ Rel. 17 2-1 | Yes | N/A | Release 18 eMTC UE cannot get autonomous GNSS position fix in RRC Connected state | Per UE | No | No | Note: This applies to non-DRX  Note: For a UE that supports this FG in NGSO, it must also support Rel. 18 2-3a  Note: If a UE support this FG and does not support Rel. 18 FG 2-3a, an undetected mobility state change at the UE may interrupt a long connection | Optional with capability signalling |
| 2. IoT\_NTN\_enh | 2-4b | GNSS position fix in RRC Connected state for NB-IoT—autonomous | 1. UE re-acquires GNSS autonomously (when configured by the network) if it does not receive eNB GNSS measurement trigger  2. UE reports GNSS position fix time duration for measurement at least during the initial access stage and in connected mode via RRCConnectionReestablishmentComplete-NB  3. UE reports the remaining GNSS validity duration with MAC CE in connected mode | ~~[Rel. 18 2-3b],~~ Rel. 17 2-1b |  |  | Release 18 NB-IoT UE cannot get autonomous GNSS position fix in RRC Connected state | Per UE | No | No | Note: This applies to non-DRX  Note: If a UE support this FG and does not support Rel. 18 FG 2-3b, an undetected mobility state change at the UE may interrupt a long connection | Optional with capability signalling |

**Proposal:**

* **For intra frequency measurement (FG45-1), each candidate cell to be measured is on the same band as a configured cell in a band combination.**
* **For inter-frequency measurement (FG45-1a), the candidate cell to be measured can be on any band in the band combination.**
* **Introduce the following, new, separate FG for a UE to report the capability of inter-frequency measurement outside of the reported BC of 45-1a**

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| 45. NR\_Mob\_enh2 | 45-x | Inter-frequency L1 measurement outside of band combination for serving cells | UE is able to perform Inter-frequency L1 measurement of candidate cells on the band(s) outside of band combination reported in 45-1a | 45-1a | Yes | No | UE is not able to perform L1 measurement outside of band combination reported in 45-1a | Per BC | No | No | n/a |  | Optional with capability signallin |

**Proposal: Adopt the following changes highlighted in chromatic fonts, while keeping the yellow highlighting, if any, as shown**

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| 45. NR\_Mob\_enh2 | 45-3 | Beam indication with joint DL/UL LTM TCI states | 1. Support of unified TCI with joint DL/UL LTM TCI-state indication for LTM procedure.  2. Maximum number of configured joint LTM TCI state(s) per candidate cell  3. Support of indicating and activating a single joint LTM TCI state in a cell switch command.  4. Supported QCL source RS in the LTM TCI-stateconfiguration  5. Maximum number of configured joint LTM TCI state(s) across candidate cells  6. Maximum number of configured cells for joint LTM TCI states | ~~23-1-1,~~ RAN2 FG for LTM | Yes | No | UE does not support Beam indication with joint DL/UL LTM TCI states | Per band | No | No | n/a | Component 2 candidate values: {8, 12, 16, 24, 32, 48, 64, 128}  Component 4 candidate values: {SSB, TRS, both}  Component 5 candidate values: {8, 16, 24, 32, …, 1024}  Component 6 candidate values: {1,2,3,4,5,6,7,8} | Optional with capability signalling |
| 45. NR\_Mob\_enh2 | 45-4 | Beam indication with separate DL/UL LTM TCI states | 1. Support of unified TCI with separate DL/UL TCI-state indication for LTM procedure.  2. Maximum number of configured DL TCI state(s) per candidate cell  3. Maximum number of configured UL TCI state(s) per candidate cell  4. Support of indicating and activating a pair of UL/DL TCI-state in a cell switch command.  5. Supported QCL source RS in the LTM TCI-state configuration  7. Maximum number of configured separate DL LTM TCI state(s) across candidate cells  8. Maximum number of configured separate UL LTM TCI state(s) across candidate cells  9. Maximum number of configured cells for separate DL/UL LTM TCI states | ~~23-10-1,~~ RAN2 FG for LTM | Yes | No | UE does not support Rel-18 LTM operation with separate DL/UL TCI states | Per band | No | No | n/a | Component 2 candidate values: {4, 8, 12, 16, 24, 32, 48, 64, 128}  Component 3 candidate values: {4, 8, 12, 16, 24, 32, 48, 64}  Component 5 candidate values: {SSB, TRS, both}  Component 7 candidate values: {8, 16, 24, 32, …, 1024}  Component 8 candidate values: {4, 8, 12, 16, …, 512}  Component 9 candidate values: {1,2,3,4,5,6,7,8} | Optional with capability signalling |

[R1-2405835](file:///C:\Users\youns\OneDrive\Documents\3GPP\RAN1\TSGR1_118\Docs\R1-2405835.zip) UE features for other Rel-18 work items (Topics B) Huawei, HiSilicon

[R1-2406352](file:///C:\Users\youns\OneDrive\Documents\3GPP\RAN1\TSGR1_118\Docs\R1-2406352.zip) Remaining issues on UE features for Rel-18 LTM CATT

[R1-2406636](file:///C:\Users\youns\OneDrive\Documents\3GPP\RAN1\TSGR1_118\Docs\R1-2406636.zip) UE features for other Rel-18 work items (Topics B) Samsung

[R1-2406798](file:///C:\Users\youns\OneDrive\Documents\3GPP\RAN1\TSGR1_118\Docs\R1-2406798.zip) UE Features for Other Topics B (NES, MobEnh, IoT-NTN) Nokia

[R1-2406825](file:///C:\Users\youns\OneDrive\Documents\3GPP\RAN1\TSGR1_118\Docs\R1-2406825.zip) Views on UE features for other Rel-18 work items (Topics B) Apple

[R1-2406919](file:///C:\Users\youns\OneDrive\Documents\3GPP\RAN1\TSGR1_118\Docs\R1-2406919.zip) Discussion on UE features for other Rel-18 work items (Topics B) NTT DOCOMO, INC.

[R1-2406961](file:///C:\Users\youns\OneDrive\Documents\3GPP\RAN1\TSGR1_118\Docs\R1-2406961.zip) UE features for other Rel-18 work items (Topics B) ZTE Corporation, Sanechips

[R1-2407018](file:///C:\Users\youns\OneDrive\Documents\3GPP\RAN1\TSGR1_118\Docs\R1-2407018.zip) UE features for other Rel-18 work items (Topics B) Qualcomm Incorporated

[R1-2407055](file:///C:\Users\youns\OneDrive\Documents\3GPP\RAN1\TSGR1_118\Docs\R1-2407055.zip) Rel-18 UE features topics set B Ericsson