

PERFORMING RESOURCE MAPPING OF INTER-CELL MULTI TRANSMISSION/RECEPTION POINT OPERATION

TECHNICAL FIELD

The disclosure relates generally to wireless communications, including but not limited to systems and methods for resource mapping of inter-cell multi-transmission/reception point (TRP) operation.

BACKGROUND

The standardization organization Third Generation Partnership Project (3GPP) is currently in the process of specifying a new Radio Interface called 5G New Radio (5G NR) as well as a Next Generation Packet Core Network (NG-CN or NGC). The 5G NR will have three main components: a 5G Access Network (5G-AN), a 5G Core Network (5GC), and a User Equipment (UE). In order to facilitate the enablement of different data services and requirements, the elements of the 5GC, also called Network Functions, have been simplified with some of them being software based so that they could be adapted according to need.

SUMMARY

The examples ~~embodiments~~ disclosed herein are directed to solving the issues relating to one or more of the problems presented in the prior art, as well as providing additional features that will become readily apparent by reference to the following detailed description when taken in conjunction with the accompany drawings. In accordance with various ~~embodiments~~, example systems, methods, devices and computer program products are disclosed herein. It is understood, however, that these ~~embodiments~~ examples are presented by way of example and are not limiting, and it will be apparent to those of ordinary skill in the art who read the present disclosure that various modifications to the disclosed ~~embodiments~~ examples can be made while remaining within the scope of this disclosure.

In a first aspect, the present disclosure provides a method comprising: determining, by a wireless communication device, at least one resource element that is scheduled for a defined communication associated with a first configuration index, and is assigned for use for at least one

signal associated with a second configuration index; and performing, by the wireless communication device, the defined communication using resource elements other than the determined at least one resource element.

At least one ~~aspect-example~~ is directed to a system, a method, an apparatus, or a computer-readable medium. In a second aspect, the present disclosure provides ~~Aa~~ a wireless communication device ~~may-comprising: at least one processor configured to:~~ determine at least one resource element that is scheduled for a defined communication -associated with a first configuration

index, and is assigned for use for at least one signal associated with a second configuration index; ~~and.~~ ~~The wireless communication device may~~ perform the defined communication using resource elements other than the determined at least one resource element.

In some ~~embodiments~~ examples, the defined communication may include reception of a physical downlink shared channel (PDSCH). In some ~~embodiments~~ examples, the at least one signal may include a SS/PBCH block (SSB). In some ~~embodiments~~ examples, the first configuration index may be same as the second configuration index.

In some ~~embodiments~~ examples, the first configuration index or the second configuration index may include a transmission configuration indicator (TCI) state index, a physical cell identity (PCI) index, or a control resource set (CORESET) pool index. In some ~~embodiments~~ examples, the SSB may be used as or associated with a quasi co-location (QCL) source corresponding to the PDSCH. The SSB may be used for RRM measurement, or may be configured in a higher-layer parameter *MeasObjectNR* information element (IE).

In some ~~embodiments~~ examples, the SSB may be indicated in a TCI state of a TCI state list configured by radio resource control (RRC) signalling. The TCI state list may be associated with a serving cell of the PDSCH. In some ~~embodiments~~ examples, the SSB may be indicated in a TCI state of a TCI state list activated by a media access control control element (MAC CE) signalling. The TCI state list may be associated with a bandwidth part (BWP) of the PDSCH. In some ~~embodiments~~ examples, the SSB may be indicated in a TCI state indicated by a downlink control information (DCI) signalling. The TCI state may be associated with the PDSCH.

In some ~~embodiments~~ examples, the SSB may be used as a QCL source of a tracking reference signal (TRS) or a channel state information reference signal (CSI-RS) for mobility measurement. The TRS or the CSI-RS may include a QCL source of the PDSCH. In some ~~embodiments~~ examples, the SSB may be used for positioning.

In some ~~embodiments~~ examples, the SSB may be used as or associated with a QCL source corresponding to at least one other signal or channel other than the PDSCH. In some ~~embodiments~~ examples, the at least one other signal or channel may include another PDSCH, and a configuration index of the another PDSCH may be same as the first configuration index.

In some ~~embodiments~~ examples, the defined communication may include reception of a physical downlink shared channel (PDSCH). In some ~~embodiments~~ examples, the at least one signal may include a SS/PBCH block. In some ~~embodiments~~ examples, the first configuration index may be different from the second configuration index.

In some ~~embodiments~~ examples, the first configuration index or the second configuration index may include a transmission configuration indicator (TCI) state index, a physical cell identity (PCI) index, or a control resource set (CORESET) pool index. In some embodiments, the SSB may be used as or associated with a quasi co-location (QCL) source corresponding to the PDSCH. The SSB may be used for RRM measurement, or may be configured in a higher-layer parameter *MeasObjectNR* information element (IE).

In some ~~embodiments~~ examples, the SSB may be indicated in a TCI state of a TCI state list configured by radio resource control (RRC) signalling. The TCI state list may be associated with a serving cell of the PDSCH. In some ~~embodiments~~ examples, the SSB may be indicated in a TCI state of a TCI state list activated by a media access control control element (MAC CE) signalling. The TCI state list may be associated with a bandwidth part (BWP) of the PDSCH. In some ~~embodiments~~ examples, the SSB may be indicated in a TCI state indicated by a downlink control information (DCI) signalling. The TCI state may be associated with the PDSCH.

In some ~~embodiments~~ examples, the SSB may be used as a QCL source of a tracking reference signal (TRS) or a channel state information reference signal (CSI-RS) for mobility measurement. The TRS or the CSI-RS may include a QCL source of the PDSCH. In some ~~embodiments~~ examples, the SSB may be used for positioning. In some ~~embodiments~~ examples, the SSB may be used as or associated with a QCL source corresponding to at least one other signal or channel other than the PDSCH. In some ~~embodiments~~ examples, the at least one other signal or channel may include another PDSCH, and a configuration index of the another PDSCH is same as the first configuration index.

In some ~~embodiments~~ examples, the defined communication may include reception of a physical downlink shared channel (PDSCH). In some ~~embodiments~~ examples, the at least one signal may include a channel state information reference signal (CSI-RS). In some ~~embodiments~~ examples, the first configuration index is same as the second configuration index.

In some ~~embodiments~~ examples, the first configuration index or the second configuration index may include a transmission configuration indicator (TCI) state index, a physical cell identity (PCI) index, or a control resource set (CORESET) pool index. In some ~~embodiments~~ examples, the CSI-RS may be used as or associated with a quasi co-location (QCL) source corresponding to the PDSCH. The CSI-RS may be used for mobility measurement, or may be configured in a higher-layer parameter *MeasObjectNR* information element (IE).

In some ~~embodiments~~ examples, the CSI-RS may be indicated in a TCI state of a TCI state list configured by radio resource control (RRC) signalling, the TCI state list associated with a serving cell of the PDSCH. In some ~~embodiments~~ examples, the CSI-RS may be indicated in a TCI state of a TCI state list activated by a media access control control element (MAC CE) signalling. The TCI state list may be associated with a bandwidth part (BWP) of the PDSCH. In some ~~embodiments~~ examples, the CSI-RS may be indicated in a TCI state indicated by a downlink control information (DCI) signalling. The TCI state may be associated with the PDSCH.

In some ~~embodiments~~ examples, the CSI-RS may be used for positioning, tracking, or computation of layer 1 reference signal received power (L1-RSRP) or layer 1 signal-to-interference ratio (L1-SINR). In some ~~embodiments~~ examples, the CSI-RS maybe used as or associated with a QCL source corresponding to at least one other signal or channel other than the PDSCH. In some ~~embodiments~~ examples, the at least one other signal or channel may include another PDSCH, and a configuration index of the another PDSCH is same as the first configuration index.

In some ~~embodiments~~ examples, the defined communication may include reception of a physical downlink shared channel (PDSCH). In some embodiments, the at least one signal may include a channel state information reference signal (CSI-RS). In some ~~embodiments~~ examples, the first configuration index may be different from the second configuration index.

In some ~~embodiments~~ examples, the first configuration index or the second configuration index may include a transmission configuration indicator (TCI) state index, a physical cell identity (PCI) index, or a control resource set (CORESET) pool index. In some ~~embodiments~~ examples, the CSI-RS may be used as or associated with a quasi co-location QCL

source corresponding to the PDSCH. The SSB may be used for RRM measurement, or may be configured in a higher-layer parameter *MeasObjectNR* information element (IE).

In some ~~embodiments~~ examples, the CSI-RS may be indicated in a TCI state of a TCI state list configured by radio resource control (RRC) signalling. The TCI state list may be associated with a serving cell of the PDSCH. In some ~~embodiments~~ examples, the CSI-RS may be indicated in a TCI state of a TCI state list activated by a media access control control element (MAC CE) signalling. The TCI state list may be associated with a bandwidth part (BWP) of the PDSCH. In some ~~embodiments~~ examples, the CSI-RS may be indicated in a TCI state indicated by a downlink control information (DCI) signalling. The TCI state may be associated with the PDSCH.

In some ~~embodiments~~ examples, the CSI-RS may be used for positioning, tracking, or computation of layer 1 reference signal received power (L1-RSRP) or layer 1 signal-to-interference ratio (L1-SINR). In some ~~embodiments~~ examples, the CSI-RS may be used as or associated with a QCL) source corresponding to at least one other signal or channel other than the PDSCH. In some ~~embodiments~~ examples, the at least one other signal or channel may include another PDSCH, and a configuration index of the another PDSCH is same as the first configuration index.

In some ~~embodiments~~ examples, the defined communication may include reception of a physical downlink shared channel (PDSCH). In some ~~embodiments~~ examples, the at least one signal may include another PDSCH. In some ~~embodiments~~ examples, the first configuration index may be same as or different from the second configuration index. In some ~~embodiments~~ examples, the first configuration index or the second configuration index may include a transmission configuration indicator (TCI) state index, a physical cell identity (PCI) index, or a control resource set (CORESET) pool index.

In some ~~embodiments~~ examples, the defined communication may include transmission of a physical uplink shared channel (PUSCH). In some ~~embodiments~~ examples, the at least one signal may include a sounding reference signal (SRS). In some ~~embodiments~~ examples, the first configuration index may be same as the second configuration index.

In some ~~embodiments~~ examples, the first configuration index or the second configuration index may include spatial relation information (SRI) information, a transmission configuration indicator (TCI) state index, a physical cell identity (PCI) index, or a control resource

set (CORESET) pool index. In some ~~embodiments~~ examples, the SRS may be used as or associated with a quasi co-location (QCL) source corresponding to the PUSCH. The SRS may be used for

mobility measurement, or may be configured in a higher-layer parameter *MeasObjectNR* information element (IE).

In some ~~embodiments~~ examples, the SRS may be indicated in spatial relation information (SRI) index configured by radio resource control (RRC) signalling. The spatial relation information (SRI) index may be associated with a serving cell of the PUSCH. In some ~~embodiments~~ examples, the SRS may be indicated in spatial relation information activated by a media access control control element (MAC CE) signalling. The spatial relation information may be associated with a bandwidth part (BWP) of the PUSCH. In some ~~embodiments~~ examples, the SRS may be indicated in spatial relation information (SRI) index indicated by a downlink control information (DCI) signalling. The spatial relation information may be associated with the PUSCH.

In some ~~embodiments~~ examples, the SRS may be used for channel sounding, positioning, antenna switching, carrier switching, computation of reference signal received power (RSRP) or signal and interference to noise ratio (SINR), or configuration of one or more transmit power control (TPC) commands. In some ~~embodiments~~ examples, the SRS may be used as or associated with a QCL source corresponding to at least one other signal or channel other than the PUSCH. In some ~~embodiments~~ examples, the at least one other signal or channel may include another PUSCH, and a configuration index of the another PUSCH is same as the first configuration index.

In some ~~embodiments~~ examples, the defined communication may include transmission of a physical uplink shared channel (PUSCH). In some ~~embodiments~~ examples, the at least one signal may include a sounding reference signal (SRS). In some ~~embodiments~~ examples, the first configuration index may be different from the second configuration index.

In some ~~embodiments~~ examples, the first configuration index or the second configuration index may include spatial relation information (SRI) index, a transmission configuration indicator (TCI) state index, a physical cell identity (PCI) index, or a control resource set (CORESET) pool index. In some ~~embodiments~~ examples, the SRS may be used as or associated with a quasi co-location (QCL) source corresponding to the PUSCH. The SRS may be used for

mobility measurement, or may be configured in a higher-layer parameter *MeasObjectNR* information element (IE).

In some ~~embodiments~~ examples, the SRS may be indicated in spatial relation information configured by radio resource control (RRC) signalling. The spatial relation information (SRI) index may be associated with a serving cell of the PUSCH. In some ~~embodiments~~ examples, the SRS may be indicated in spatial relation information activated by a media access control control element (MAC CE) signalling. The spatial relation information (SRI) index may be associated with a bandwidth part (BWP) of the PUSCH. In some ~~embodiments~~ examples, the SRS may be indicated in spatial relation information indicated by a downlink control information (DCI) signalling. The spatial relation information (SRI) index may be associated with the PUSCH.

In some ~~embodiments~~ examples, the SRS may be used for channel sounding, positioning, antenna switching, carrier switching, computation of reference signal received power (RSRP) or signal and interference to noise ratio (SINR), or configuration of one or more transmit power control (TPC) commands.

In some ~~embodiments~~ examples, the defined communication may include transmission of a physical uplink shared channel (PUSCH). In some ~~embodiments~~ examples, the at least one signal may include another PUSCH. In some ~~embodiments~~ examples, the first configuration index may be same as or different from the second configuration index. In some ~~embodiments~~ examples, the first configuration index or the second configuration index may include spatial relation information (SRI) index, a transmission configuration indicator (TCI) state index, a physical cell identity (PCI) index, or a control resource set (CORESET) pool index.

At least one ~~aspect-example~~ is directed to a system, a method, an apparatus, or a computer-readable medium. A wireless communication device may receive, from a wireless communication node, an indication that a set of resources is scheduled for a first defined communication and a second defined communication. The first defined communication is associated with a first physical cell identity (PCI) value, and the second defined communication is associated with a second PCI value.

In some ~~embodiments~~ examples, the first defined communication may be one of: a downlink reception or an uplink transmission, and the second defined communication is another

of: the downlink reception or the uplink transmission. In some ~~embodiments~~ examples, the wireless

communication device may determine to perform only one of the first defined communication or the second defined communication, using the scheduled set of resources.

In some ~~embodiments~~ examples, the wireless communication device may determine that the set of resources is configured or indicated for at least one of: the first defined communication or the first PCI value. In some ~~embodiments~~ examples, the wireless communication device may determine that the second communication would overlap with the first defined communication in at least part of the set of resources. In some ~~embodiments~~ examples, the wireless communication device may determine, responsive to the determination that the second communication would overlap with the first defined communication, to perform only the first defined communication, using the scheduled set of resources.

In some ~~embodiments~~ examples, the first defined communication may include a SS/PBCH block (SSB) that is used for radio resource management (RRM) measurement, or is configured in a higher-layer parameter *MeasObjectNR* information element (IE). In some ~~embodiments~~ examples, the first defined communication may include a channel state information reference signal (CSI-RS) that is used as a quasi co-location (QCL) source of another first defined communication associated with the first PCI value.

In some ~~embodiments~~ examples, the second defined communication may include a physical downlink shared channel (PDSCH), a physical uplink shared channel (PUSCH), a preamble random access channel (PRACH), or a sounding reference signal (SRS). In some ~~embodiments~~ examples, the first defined communication may include a sounding reference signal (SRS) that is used for radio resource management (RRM) measurement, or is configured in a higher-layer parameter *MeasObjectNR* information element (IE).

In some ~~embodiments~~ examples, the second defined communication may include a physical downlink control channel (PDCCH), a physical downlink shared channel (PDSCH), a channel state information reference signal (CSI-RS), or a downlink positioning reference signal (DL-PRS) which is without a measurement gap.

In some ~~embodiments~~ examples, at least one of the first defined communication or the second defined communication may include a plurality of downlink receptions within a reception timing

window. In some ~~embodiments~~ examples, the wireless communication device may determine that a largest time difference between any two of the plurality of downlink receptions exceeds a cyclic prefix (CP).

In some ~~embodiments~~ examples, the wireless communication device may perform only one of the plurality of downlink receptions within the reception timing window. In some ~~embodiments~~ examples, the one of the plurality of downlink receptions may have a highest priority among the plurality of downlink receptions. In some ~~embodiments~~ examples, the reception timing window may include a set of symbols or slots. In some ~~embodiments~~ examples, the wireless communication device may perform only a subset of the plurality of downlink receptions within the reception timing window.

In some ~~embodiments~~ examples, the subset of the plurality of downlink receptions may be from a same cell or configured with a same physical cell identity (PCI) value. In some ~~embodiments~~ examples, the subset of the plurality of downlink receptions may be associated with one or more PCI values. In some ~~embodiments~~ examples, the reception timing window may include a set of symbols or slots.

In some ~~embodiments~~ examples, a wireless communication node may transmit, to a wireless communication device, an indication that a set of resources is scheduled for a first defined communication and a second defined communication. In some ~~embodiments~~ examples, the first defined communication may be associated with a first physical cell identity (PCI) value, and the second defined communication may be associated with a second PCI value.

BRIEF DESCRIPTION OF THE DRAWINGS

Various example embodiments of the present solution are described in detail below with reference to the following figures or drawings. The drawings are provided for purposes of illustration only and merely depict example embodiments of the present solution to facilitate the reader's understanding of the present solution. Therefore, the drawings should not be considered limiting of the breadth, scope, or applicability of the present solution. It should be noted that for clarity and ease of illustration, these drawings are not necessarily drawn to scale.

FIG. 1 illustrates an example cellular communication network in which techniques disclosed herein may be implemented, in accordance with an embodiment of the present disclosure;

CLAIMS

1. A method comprising:
determining, by a wireless communication device, at least one resource element that is scheduled for a defined communication associated with a first configuration index, and is assigned for use for at least one signal associated with a second configuration index; and
performing, by the wireless communication device, the defined communication using resource elements other than the determined at least one resource element.
2. The method of claim 1, wherein:
the defined communication comprises reception of a physical downlink shared channel (PDSCH),
the at least one signal comprises a synchronization signal/physical broadcast channel (SS/PBCH) block (SSB), and
the first configuration index is same as the second configuration index.
3. The method of claim 2, wherein the first configuration index or the second configuration index comprises a transmission configuration indicator (TCI) state index, a physical cell identity (PCI) index, or a control resource set (CORESET) pool index.
4. The method of claim 2, wherein the SSB is used as or associated with a quasi co-location QCL source corresponding to the PDSCH, wherein the SSB is used for RRM measurement, or is configured in a higher-layer parameter *MeasObjectNR* information element (IE).
- ~~5. The method of claim 4, wherein the SSB is indicated in:
a TCI state of a TCI state list configured by radio resource control (RRC) signalling, the TCI state list associated with a serving cell of the PDSCH,
a TCI state of a TCI state list activated by a media access control control element (MAC CE) signalling, the TCI state list associated with a bandwidth part (BWP) of the PDSCH, or
a TCI state indicated by a downlink control information (DCI) signalling, the TCI state associated with the PDSCH.~~

~~65.~~ The method of claim 2, wherein the SSB is used as a QCL source of a tracking reference signal (TRS) or a channel state information reference signal (CSI-RS) for mobility measurement, wherein the TRS or the CSI-RS comprises a QCL source of the PDSCH.

~~76.~~ The method of claim 2, wherein the SSB is used for positioning.

~~87.~~ The method of claim 2, wherein the SSB is used as or associated with a (QCL) source corresponding to at least one other signal or channel other than the PDSCH.

~~9. — The method of claim 8, wherein the at least one other signal or channel comprises another PDSCH, and a configuration index of the another PDSCH is same as the first configuration index.~~

~~108.~~ The method of claim 1, wherein:

the defined communication comprises reception of a physical downlink shared channel (PDSCH),

the at least one signal comprises a synchronization signal/physical broadcast channel (SS/PBCH) block (SSB), and

the first configuration index is different from the second configuration index.

~~119.~~ The method of claim ~~108~~, wherein the first configuration index or the second configuration index comprises a transmission configuration indicator (TCI) state index, a physical cell identity (PCI) index, or a control resource set (CORESET) pool index.

~~1210.~~ The method of claim ~~108~~, wherein the SSB is used as or associated with a quasi co-location (QCL) source corresponding to the PDSCH, wherein the SSB is used for RRM measurement, or is configured in a higher-layer parameter *MeasObjectNR* information element (IE).

~~13. — The method of claim 12, wherein the SSB is indicated in:~~

~~a TCI state of a TCI state list configured by radio resource control (RRC) signalling, the TCI state list associated with a serving cell of the PDSCH,~~

~~a TCI state of a TCI state list activated by a media access control control element (MAC CE) signalling, the TCI state list associated with a bandwidth part (BWP) of the PDSCH, or
a TCI state indicated by a downlink control information (DCI) signalling, the TCI state associated with the PDSCH.~~

~~14. — The method of claim 13, wherein the SSB is used as a QCL source of a tracking reference signal (TRS) or a channel state information reference signal (CSI-RS) for mobility measurement, wherein the TRS or the CSI-RS comprises a QCL source of the PDSCH.~~

~~15~~11. The method of claim ~~10~~8, wherein the SSB is used for positioning.

~~16~~12. The method of claim ~~10~~8, wherein the SSB is used as or associated with a QCL source corresponding to at least one other signal or channel other than the PDSCH.

~~17. — The method of claim 16, wherein the at least one other signal or channel comprises another PDSCH, and a configuration index of the another PDSCH is same as the first configuration index.~~

~~18~~13. The method of claim 1, wherein:

the defined communication comprises reception of a physical downlink shared channel (PDSCH),

the at least one signal comprises a channel state information reference signal (CSI-RS),
and

the first configuration index is same as the second configuration index.

~~19~~14. The method of claim ~~18~~13, wherein the first configuration index or the second configuration index comprises a transmission configuration indicator (TCI) state index, a physical cell identity (PCI) index, or a control resource set (CORESET) pool index.

~~20. — The method of claim 18, wherein the CSI-RS is used as or associated with a quasi-co-location (QCL) source corresponding to the PDSCH, wherein the CSI-RS is used for mobility measurement, or is configured in a higher-layer parameter *MeasObjectNR* information element~~

(HE).

~~21. The method of claim 20, wherein the CSI-RS is indicated in:~~

~~a TCI state of a TCI state list configured by radio resource control (RRC) signalling, the TCI state list associated with a serving cell of the PDSCH,~~

~~a TCI state of a TCI state list activated by a media access control control element (MAC CE) signalling, the TCI state list associated with a bandwidth part (BWP) of the PDSCH, or~~

~~a TCI state indicated by a downlink control information (DCI) signalling, the TCI state associated with the PDSCH.~~

~~22. The method of claim 18, wherein the CSI-RS is used for positioning, tracking, or computation of layer 1 reference signal received power (L1-RSRP) or layer 1 signal-to-interference ratio (L1-SINR).~~

~~23. The method of claim 18, wherein the CSI-RS is used as or associated with a QCL source corresponding to at least one other signal or channel other than the PDSCH.~~

~~24. The method of claim 23, wherein the at least one other signal or channel comprises another PDSCH, and a configuration index of the another PDSCH is same as the first configuration index.~~

~~25~~15. The method of claim 1, wherein:

the defined communication comprises reception of a physical downlink shared channel (PDSCH),

the at least one signal comprises a channel state information reference signal (CSI-RS),
and

the first configuration index is different from the second configuration index.

~~26. The method of claim 25, wherein the first configuration index or the second configuration index comprises a transmission configuration indicator (TCI) state index, a physical cell identity (PCI) index, or a control resource set (CORESET) pool index.~~

~~27. The method of claim 25, wherein the CSI-RS is used as or associated with a quasi-co-location (QCL) source corresponding to the PDSCH, wherein the SSB is used for RRM measurement, or is configured in a higher layer parameter *MeasObjectNR* information element (IE).~~

~~28. The method of claim 27, wherein the CSI-RS is indicated in:~~

~~a TCI state of a TCI state list configured by radio resource control (RRC) signalling, the TCI state list associated with a serving cell of the PDSCH,~~

~~a TCI state of a TCI state list activated by a media access control control element (MAC CE) signalling, the TCI state list associated with a bandwidth part (BWP) of the PDSCH, or~~

~~a TCI state indicated by a downlink control information (DCI) signalling, the TCI state associated with the PDSCH.~~

~~29. The method of claim 25, wherein the CSI-RS is used for positioning, tracking, or computation of layer 1 reference signal received power (L1-RSRP) or layer 1 signal-to-interference ratio (L1-SINR).~~

~~30. The method of claim 25, wherein the CSI-RS is used as or associated with a QCL source corresponding to at least one other signal or channel other than the PDSCH.~~

~~31. The method of claim 30, wherein the at least one other signal or channel comprises another PDSCH, and a configuration index of the another PDSCH is same as the first configuration index.~~

~~32~~16. The method of claim 1, wherein:

the defined communication comprises reception of a physical downlink shared channel (PDSCH),

the at least one signal comprises another PDSCH, and

the first configuration index is same as or different from the second configuration index.

~~33. The method of claim 32, wherein the first configuration index or the second configuration index comprises a transmission configuration indicator (TCI) state index, a physical cell identity~~

~~(PCI) index, or a control resource set (CORESET) pool index.~~

~~3417.~~ The method of claim 1, wherein:

the defined communication comprises transmission of a physical uplink shared channel (PUSCH),

the at least one signal comprises a sounding reference signal (SRS), and

the first configuration index is same as the second configuration index.

~~35. — The method of claim 34, wherein the first configuration index or the second configuration index comprises spatial relation information (SRI) information, a transmission configuration indicator (TCI) state index, a physical cell identity (PCI) index, or a control resource set (CORESET) pool index.~~

~~36. — The method of claim 34, wherein the SRS is used as or associated with a quasi co-location (QCL) source corresponding to the PUSCH, wherein the SRS is used for mobility measurement, or is configured in a higher layer parameter *MeasObjectNR* information element (IE).~~

~~37. — The method of claim 36, wherein the SRS is indicated in:~~

~~spatial relation information (SRI) index configured by radio resource control (RRC) signalling, the spatial relation information (SRI) index associated with a serving cell of the PUSCH,~~

~~spatial relation information activated by a media access control control element (MAC CE) signalling, the spatial relation information associated with a bandwidth part (BWP) of the PUSCH,~~
~~or~~

~~spatial relation information (SRI) index indicated by a downlink control information (DCI) signalling, the spatial relation information associated with the PUSCH.~~

~~38. — The method of claim 34, wherein the SRS is used for channel sounding, positioning, antenna switching, carrier switching, computation of reference signal received power (RSRP) or signal and interference to noise ratio (SINR), or configuration of one or more transmit power control (TPC) commands.~~

~~39. — The method of claim 34, wherein the SRS is used as or associated with a QCL source corresponding to at least one other signal or channel other than the PUSCH.~~

~~40. — The method of claim 39, wherein the at least one other signal or channel comprises another PUSCH, and a configuration index of the another PUSCH is same as the first configuration index.~~

~~41~~18. The method of claim 1, wherein:

the defined communication comprises transmission of a physical uplink shared channel (PUSCH),

the at least one signal comprises a sounding reference signal (SRS), and

the first configuration index is different from the second configuration index.

~~42. — The method of claim 41, wherein the first configuration index or the second configuration index comprises spatial relation information (SRI) index, a transmission configuration indicator (TCI) state index, a physical cell identity (PCI) index, or a control resource set (CORESET) pool index.~~

~~43. — The method of claim 41, wherein the SRS is used as or associated with a quasi co-location (QCL) source corresponding to the PUSCH, wherein the SRS is used for mobility measurement, or is configured in a higher layer parameter *MeasObjectNR* information element (IE).~~

~~44. — The method of claim 43, wherein the SRS is indicated in:~~

~~spatial relation information configured by radio resource control (RRC) signalling, the spatial relation information (SRI) index associated with a serving cell of the PUSCH,~~

~~spatial relation information activated by a media access control control element (MAC CE) signalling, the spatial relation information (SRI) index associated with a bandwidth part (BWP) of the PUSCH, or~~

~~-spatial relation information indicated by a downlink control information (DCI) signalling, the spatial relation information (SRI) index associated with the PUSCH.~~

~~45. — The method of claim 41, wherein the SRS is used for channel sounding, positioning,~~

~~antenna switching, carrier switching, computation of reference signal received power (RSRP) or signal and interference to noise ratio (SINR), or configuration of one or more transmit power control (TPC) commands.~~

4619. The method of claim 1, wherein:

the defined communication comprises transmission of a physical uplink shared channel (PUSCH),

the at least one signal comprises another PUSCH, and

the first configuration index is same as or different from the second configuration index.

20. A wireless communication device comprising:

at least one processor configured to:

determine at least one resource element that is scheduled for a defined communication associated with a first configuration index, and is assigned for use for at least one signal associated with a second configuration index; and

perform the defined communication using resource elements other than the determined at least one resource element

~~47. The method of claim 46, wherein the first configuration index or the second configuration index comprises spatial relation information (SRI) index, a transmission configuration indicator (TCI) state index, a physical cell identity (PCI) index, or a control resource set (CORESET) pool index.~~

~~48. A non-transitory computer readable medium storing instructions, which when executed by at least one processor, cause the at least one processor to perform the method of any one of claims 1-47.~~

~~49. An apparatus comprising:~~

~~at least one processor configured to implement the method of any one of claims 1-47.~~