

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 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 example systems, methods, devices and computer program products are disclosed herein. It is understood, however, that these 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 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 that is same as the first 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 example is directed to a system, a method, an apparatus, or a computer-readable medium. In a second aspect, the present disclosure provides 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 that is same as the first configuration index; and perform the defined communication using resource elements other than the determined at least one resource element. In a third aspect, the present disclosure provides 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 according to the first aspect.

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

In some 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 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 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 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 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 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 examples, the SSB may be used for positioning.

In some 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 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.

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 that is same as the first 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), and
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~~2, wherein the SSB is indicated in a TCI state of a TCI state list configured by radio resource control (RRC) signaling ~~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.~~
6. The method of claim ~~2~~1, wherein: ~~the SSB is used for positioning~~

the defined communication comprises reception of a physical uplink shared channel (PUSCH), physical uplink control channel (PUCCH), a preamble random access channel (PRACH), or a sounding reference signal (SRS), and

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

7. The method of claim 12, 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~~

the defined communication comprises reception of a physical downlink control channel (PDCCH), or a downlink positioning reference signal (DL-PRS), and
the at least one signal comprises a synchronization signal/physical broadcast channel (SS/PBCH) block (SSB).

8. ~~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.~~

9. ~~The method of claim 8, 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.~~

10. ~~The method of claim 8, 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).~~

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

12. ~~The method of claim 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.~~

~~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.~~

~~14. The method of claim 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.~~

~~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.~~

~~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.~~

~~17. 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.~~

~~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.~~

~~19. 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.~~

~~208.~~ 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 that is same as the first configuration index; and

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

~~9. The wireless communication device of claim 8, wherein:~~

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

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

~~10. The wireless communication device of claim 9, wherein the first configuration index or the second configuration index comprises a physical cell identity (PCI) index.~~

11. The wireless communication device of claim 9, wherein the SSB is used as a quasi co-location QCL source corresponding to the PDSCH.

12. The wireless communication device of claim 11, wherein the SSB is indicated in a TCI state of a TCI state list configured by radio resource control (RRC) signaling.

13. The wireless communication device of claim 8, wherein:
the defined communication comprises reception of a physical uplink shared channel (PUSCH), physical uplink control channel (PUCCH), a preamble random access channel (PRACH), or a sounding reference signal (SRS), and
the at least one signal comprises a synchronization signal/physical broadcast channel (SS/PBCH) block (SSB).

14. The wireless communication device of claim 8, wherein:
the defined communication comprises reception of a physical downlink control channel (PDCCH), or a downlink positioning reference signal (DL-PRS), and
the at least one signal comprises a synchronization signal/physical broadcast channel (SS/PBCH) block (SSB).

15. 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 1-7.