INFORMATION DETERMINATION METHOD AND APPARATUS, FIRST COMMUNICATION NODE AND STORAGE MEDIUM

The present application claims priority to Chinese Patent Application No. 201910945697.2, filed with the CNIPA on Sep. 30, 2019, the disclosure of which is incorporated herein by reference in its entirety

TECHNICAL FIELD

The present application relates to the field of communications, and for example to an information determination method and device, a first communication node, and a storage medium.

BACKGROUND

In the beam management, for determination of information of an uplink signal or an uplink channel, such as a beam indication, in general, a second communication node, such as a base station, configures or indicates an explicit reference signal for the uplink signal or the uplink channel in a preset manner (such as, radio resource control (RRC) signaling, MAC-CE signaling, and downlink control information (DCI)), where the reference signal may be a downlink signal, such as a synchronization signal block (SSB), a channel state information reference signal (CSI-RS), and may also be the uplink signal (such as SRS). If the reference signal is the downlink signal, then a first communication node, such as a user equipment (UE), may determine a transmission beam of the uplink signal or a transmission beam of the uplink channel according to a receiving beam of the downlink signal; and if the reference signal is the uplink signal, then the UE may determine a transmission beam of the uplink signal or a transmission beam of the uplink channel according to a transmission beam of the uplink signal.

However, in some cases, the base station cannot perform an effective beam indication of the uplink signal or an effective beam indication of the uplink channel through the above manners.

SUMMARY

Embodiments of ~~The~~ the present application provide~~s~~ an information determination method and device, a first communication node, and a storage medium.

A~~n embodiment~~ first aspect of the present application provides ~~an information determinatio~~a communication method. The ~~information determination~~communication method is applied to a first communication node, and the ~~information~~

~~determination~~communication method includes: in ~~a case where a preset~~response to a condition ~~is~~ being satisfied, a reference signal is determined, wherein the reference signal comprises a quasi co-location reference signal of a first quasi co-location type associated with an activated transmission configuration indication (TCI) state; and information of an uplink signal ~~or an uplink channel~~ is determined according to the reference signal; and communicating with a second communication node based on the information, wherein the condition comprises: the first communication node is not provided with spatial relationship information of the uplink signal, and a serving cell where the uplink signal is located does not comprise a control resource set (CORESET).

A second aspect of the present application provides a communication node comprising: a processor and a memory, wherein, when the processor reads instructions from the memory, the processor is configured to perform: in response to a condition being satisfied, determining a reference signal, wherein the reference signal comprises a quasi co-location reference signal of a first quasi co-location type associated with an activated transmission configuration indication (TCI) state; determining information of an uplink signal according to the reference signal; and communicating with a second communication node based on the information, wherein the condition comprises: the communication node is not provided with spatial relationship information of the uplink signal, and a serving cell where the uplink signal is located does not comprise a control resource set (CORESET).

A third aspect of the present application provides a method for communication between a first communication node and a second communication node, the method applied to the second communication node, and the method comprising: communicating with the first communication node based on information of an uplink signal, wherein: the information of the uplink signal is determined according to a reference signal; the reference signal, comprising a quasi co-location reference signal of a first quasi co-location type associated with an activated transmission configuration indication (TCI) state, is determined in response to a condition being satisfied; and the condition comprises: the first communication node is not provided with spatial relationship information of the uplink signal, and a serving cell where the uplink signal is located does not comprise a control resource set (CORESET).

A fourth aspect of the present application provides a communication node comprising: a processor and a memory, wherein, when the processor reads instructions from the memory, the processor is configured to perform: communicating with an other communication node based on information of an uplink signal, wherein: the information of the uplink signal is determined according to a

reference signal; the reference signal, comprising a quasi co-location reference signal of a first quasi co-location type associated with an activated transmission configuration indication (TCI) state, is determined in response to a condition being satisfied; and the condition comprises: the other communication node is not provided with spatial relationship information of the uplink signal, and a serving cell where the uplink signal is located does not comprise a control resource set (CORESET).

An embodiment of the present application further provides an information determination device. The information determination device is configured at a first communication node, and the information determination device includes a reference signal determination module and an information determination module. The reference signal determination module is configured to determine a reference signal in a case where a preset condition is satisfied. The information determination module is configured to determine information of an uplink signal or information of an uplink channel according to the reference signal.

An embodiment of the present application further provides a first communications node. The first communications node includes one or more processors and a storage device configured to store one or more programs. The one or more programs, when executed by the one or more processors, cause the one or more processors to implement any of the information determination methods in the embodiments of the present application.

An embodiment of the present application further provides a storage medium. The storage medium stores a computer program. The computer program, when executed by a processor, implements any of the information determination methods in the embodiments of the present application.

BRIEF DESCRIPTION OF DRAWINGS

FIG. 1 is a schematic flowchart of an information determination method provided in an embodiment of the present application;

FIG. 2 is a schematic structural diagram of an information determination device provided in an embodiment of the present application; and

FIG. 3 is a schematic structural diagram of a first communication node provided in an embodiment of the present application.

DETAILED DESCRIPTION

Embodiments of the present application will be described below with reference to the accompanying drawings.

What is claimed is:

1. ~~An information determination~~A communication method, applied to a first communication node, comprising:

in ~~a case where~~response to a ~~preset~~ condition ~~is~~ being satisfied, determining a reference signal, wherein the reference signal comprises a quasi co-location reference signal of a first quasi co-location type associated with an activated transmission configuration indication (TCI) state; ~~and~~

determining information of an uplink signal ~~or information of an uplink channel~~ according to the reference signal; and

communicating with a second communication node based on the information,

wherein the condition comprises:

the first communication node is not provided with spatial relationship information of the uplink signal, and

a serving cell where the uplink signal is located does not comprise a control resource set (CORESET).

~~2. The method of claim 1, wherein the preset condition comprises a first preset condition, and the reference signal comprises a quasi co-location reference signal of a first quasi co-location type associated with a physical downlink control channel (PDCCH), wherein the PDCCH schedules the uplink signal or the uplink channel.~~

~~3. The method of claim 1, wherein the preset condition comprises a first preset condition, and the reference signal comprises a quasi co-location reference signal of a first quasi co-location type associated with an activated transmission configuration indication (TCI) state, wherein the activated TCI state is applied to a physical downlink shared channel (PDSCH) and has a minimum TCI state identifier.~~

~~4. The method of claim 3, wherein the quasi co-location reference signal comprises a periodic downlink reference signal.~~

~~5. The method of claim 1, wherein the preset condition comprises a first preset condition, and the reference signal comprises a downlink signal associated with a physical random access channel~~

~~(PRACH), wherein the PRACH is a PRACH closest to the uplink signal or the uplink channel in a time domain.~~

~~6. The method of claim 5, wherein the downlink signal comprises one of a synchronization signal block, or a channel state information reference signal.~~

~~7. The method of claim 1, wherein the preset condition comprises a first preset condition, and the reference signal comprises a quasi co-location reference signal of a first quasi co-location type associated with a control resource set (CORESET) in a nearest slot, wherein the CORESET has a minimum control resource set identifier.~~

~~8. The method of any one of claims 2 to 7, wherein the first preset condition comprises at least one of:~~

~~the uplink signal is scheduled by a downlink control information (DCI) format 0_0 of a serving cell;~~

~~the uplink channel is scheduled by a DCI format 0_0 of a serving cell;~~

~~a serving cell where the uplink signal is located is not configured with a physical uplink control channel (PUCCH) resource;~~

~~a serving cell where the uplink channel is located is not configured with a PUCCH resource; or~~

~~the first communication node is not configured with a spatial setting for a PUCCH transmission.~~

~~9. The method of claim 1, wherein the preset condition comprises a second preset condition, and the reference signal comprises a reference signal configured by a second communication node.~~

~~10. The method of claim 1, wherein the preset condition comprises a second preset condition, and the reference signal comprises a quasi co-location reference signal of a first quasi co-location type associated with a PDCCH, wherein the PDCCH schedules the uplink signal or the uplink channel.~~

~~11~~2. The method of claim 1, wherein ~~the preset condition comprises a second preset condition, and the reference signal comprises a quasi co-location reference signal of a first quasi co-location type associated with an activated TCI state, wherein~~ the activated TCI state is applied to a PDSCH and has a minimum TCI state identifier.

~~12. The method of any one of claims 9 to 11, wherein the second preset condition comprises at~~

~~least one of:~~

~~the first communication node is not provided with spatial relationship information of the uplink signal or spatial relationship information of the uplink channel;~~

~~a serving cell where the uplink signal is located does not comprise a CORESET; or~~

~~a serving cell where the uplink channel is located does not comprise a CORESET.~~

~~13. The method of claim 1, wherein the preset condition comprises a third preset condition, and the reference signal comprises a reference signal configured by a second communication node.~~

~~14. The method of claim 1, wherein the preset condition comprises a third preset condition, and the reference signal comprises a quasi co-location reference signal of a first quasi co-location type associated with an activated TCI state, wherein the activated TCI state is applied to a PDSCH and has a minimum TCI state identifier.~~

~~15. The method of claim 1, wherein the preset condition comprises a third preset condition, and the reference signal comprises a quasi co-location reference signal of a first quasi co-location type associated with a CORESET in a nearest slot, wherein the CORESET has a minimum control resource set identifier.~~

~~16. The method of any one of claims 13 to 15, wherein the third preset condition comprises at least one of:~~

~~the first communication node is not provided with spatial relationship information of the uplink channel;~~

~~the first communication node is not provided with spatial relationship information of the uplink signal;~~

~~a PDCCH scheduling the uplink signal is located in a first frequency band;~~

~~a serving cell where the uplink signal is located is located in a second frequency band; wherein a frequency of the second frequency band is higher than a frequency of the first frequency band;~~

~~a PDCCH scheduling the uplink channel is located in a first frequency band;~~

~~a serving cell where the uplink channel is located is located in a second frequency band;~~

a PDCCH scheduling the uplink signal does not associate with the quasi co-location reference signal of the first quasi co-location type;

a PDCCH scheduling the uplink channel does not associate with the quasi co-location reference signal of the first quasi co-location type;

a number of uplink signal resources comprised in an uplink signal resource set is greater than 1;

a number of uplink signal resource sets is greater than 1; or

a value of a first high-level parameter is greater than 1.

17. The method of claim 1, wherein the preset condition comprises a fourth preset condition, and the reference signal comprises a path loss reference signal of a first uplink channel in a path loss reference signal set of uplink channels corresponding to the uplink channel.

18. The method of claim 1, further comprising:

in a case where a fourth preset condition is satisfied, determining a P0 of the uplink channel according to a first P0 in a target power P0 set corresponding to the uplink channel.

19. The method of any one of claims 17 to 18, wherein the fourth preset condition comprises that:

the first communication node is not provided with spatial relationship information of the uplink channel.

20. The method of claim 1, wherein the preset condition comprises a fifth preset condition, and the reference signal comprises a quasi co-location reference signal of a first quasi co-location type associated with an m-th CORESET in a nearest slot.

21. The method of claim 20, wherein the uplink signal belongs to an n-th channel sounding reference signal (SRS) resource set, wherein m and n are both positive integers, and m is equal to n.

22. The method of claim 20 or 21, wherein the fifth preset condition comprises that:

the first communication node is not provided with spatial relationship information of the uplink signal.

~~2~~3. The method of claim 1, wherein the determining the information of the uplink signal ~~or the information of the uplink channel according to the reference signal,~~ comprises ~~at least one of~~:

~~determining a transmission spatial filter of the uplink signal or a transmission spatial filter of the uplink channel according to a transmission spatial filter of the reference signal;~~

~~determining a transmission spatial filter of the uplink signal or a transmission spatial filter of the uplink channel according to a receiving spatial filter of the reference signal; or~~

determining a path loss reference signal of the uplink signal ~~or a path loss reference signal of the uplink channel~~ according to the reference signal.

~~2~~4. The method of claim 1, wherein the uplink signal comprises a sounding reference signal (SRS)~~an SRS, and the uplink channel comprises at least one of a PUCCH or a physical uplink shared channel~~.

~~25. An information determination device, configured at a first communication node, comprising:~~

~~a reference signal determination module, which is configured to determine a reference signal in a case where a preset condition is satisfied; and~~

~~an information determination module, which is configured to determine information of an uplink signal or information of an uplink channel according to the reference signal.~~

~~26. A first communications node, comprising:~~

~~at least one processor; and~~

~~a storage device, which is configured to store at least one program;~~

~~wherein the at least one program, when executed by the at least one processor, causes the at least one processor to implement the information determination method of any one of claims 1 to 24.~~

~~27. A storage medium, stored therein a computer program, wherein the computer program, when executed by a processor, implements the information determination method of any one of claims 1 to 24.~~

5. A communication node comprising:

a processor and a memory, wherein, when the processor reads instructions from the memory, the processor is configured to perform:

in response to a condition being satisfied, determining a reference signal, wherein the reference signal comprises a quasi co-location reference signal of a first quasi co-location type associated with an activated transmission configuration indication (TCI) state;

determining information of an uplink signal according to the reference signal; and

communicating with a second communication node based on the information,

wherein the condition comprises:

the communication node is not provided with spatial relationship information of the uplink signal, and

a serving cell where the uplink signal is located does not comprise a control resource set (CORESET).

6. The communication node of claim 5, wherein the activated TCI state is applied to a PDSCH and has a minimum TCI state identifier.

7. The communication node of claim 5, wherein the determining the information of the uplink signal comprises:

determining a path loss reference signal of the uplink signal according to the reference signal.

8. The communication node of claim 5, wherein the uplink signal comprises a sounding reference signal (SRS).

9. A method for communication between a first communication node and a second communication node, the method applied to the second communication node, and the method comprising:

communicating with the first communication node based on information of an uplink signal, wherein:

the information of the uplink signal is determined according to a reference signal;

the reference signal, comprising a quasi co-location reference signal of a first quasi co-location type associated with an activated transmission configuration indication (TCI) state, is determined in response to a condition being satisfied; and

the condition comprises:

the first communication node is not provided with spatial relationship information of the uplink signal, and

a serving cell where the uplink signal is located does not comprise a control resource set (CORESET).

10. The method of claim 9, wherein the activated TCI state is applied to a PDSCH and has a minimum TCI state identifier.

11. The method of claim 9, wherein:

the information of the uplink signal being determined according to the reference signal comprises a path loss reference signal of the uplink signal being determined according to the reference signal.

12. The method of claim 9, wherein the uplink signal comprises a sounding reference signal (SRS).

13. A communication node comprising:

a processor and a memory, wherein, when the processor reads instructions from the memory, the processor is configured to perform:

communicating with an other communication node based on information of an uplink signal, wherein:

the information of the uplink signal is determined according to a reference signal;

the reference signal, comprising a quasi co-location reference signal of a first quasi co-location type associated with an activated transmission configuration indication (TCI) state, is determined in response to a condition being satisfied; and

the condition comprises:

the other communication node is not provided with spatial relationship information of the uplink signal, and

a serving cell where the uplink signal is located does not comprise a control resource set (CORESET).

14. The communication node of claim 13, wherein the activated TCI state is applied to a PDSCH and has a minimum TCI state identifier.

15. The communication node of claim 13, wherein:

the information of the uplink signal being determined according to the reference signal comprises a path loss reference signal of the uplink signal being determined according to the reference signal.

16. The communication node of claim 13, wherein the uplink signal comprises a sounding reference signal (SRS).

17. A non-transitory storage medium, stored therein a computer program, wherein the computer program, when executed by a processor of a communication node, causing the processor to perform the method of claim 1.

18. A non-transitory storage medium, stored therein a computer program, wherein the computer program, when executed by a processor of a communication node, causing the processor to perform the method of claim 9.