transmitting the PUSCH, and a current PUSCH enhancement mode is designed for a single TRP but not applicable for a multi-TRP scenario.

SUMMARY

[0006] A channel transmission method and apparatus, and a storage medium are provided in embodiments of the present disclosure to overcome the problems existing in the related art.

[0007] According to a first aspect of embodiments of the present disclosure, a channel transmission method performed by a terminal is provided, and includes:

[0008] determining a mapping relationship between at least one basic redundancy version (RV) sequence and a plurality of candidate transmission occasions for sending a physical uplink shared channel (PUSCH);

[0009] determining an actual RV sequence corresponding to each of the plurality of candidate transmission occasions based on the at least one basic RV sequence; and

[0010] repeatedly sending a data block of the PUSCH on a plurality of target transmission occasions respectively based on actual RV sequences corresponding respectively to the plurality of target transmission occasions.

[0011] Optionally, determining the mapping relationship between the at least one basic RV sequence and the plurality of candidate transmission occasions for sending the PUSCH, includes:

[0012] determining the mapping relationship based on a first signaling sent by a base station; or

[0013] determining the mapping relationship based on a predefined configuration.

[0014] Optionally, determining the mapping relationship between the at least one basic RV sequence and the plurality of candidate transmission occasions for sending the PUSCH, includes:

[0015] determining a first corresponding relationship between different beam indication information received by different transmission and receiving points (TRPs) corresponding to a base station and the plurality of candidate transmission occasions; in which the beam indication information is beam related information for sending the PUSCH; and

[0016] determining the mapping relationship based on the basic RV sequences corresponding to the different beam indication information and the first corresponding relationship.

[0017] Optionally, determining the actual RV sequence corresponding to the each of the plurality of candidate transmission occasions based on the at least one basic RV sequence includes:

[0018] dividing the plurality of candidate transmission occasions into a plurality of groups; in which each group of the candidate transmission occasions corresponds to same beam indication information;

[0019] determining a basic RV sequence corresponding to each group of the candidate transmission occasions;

include all actual transmission occasions at which uplink PUSCH transmission is able to be performed in the all nominal transmission occasions.

[00159] Optionally, the plurality of candidate transmission occasions include all actual transmission occasions at which PUSCH transmission is able to be performed; and the plurality of target transmission occasions include the all actual transmission occasions.

[00160] In the above embodiments, mapping between the basic RV sequence and the plurality of candidate transmission occasions may be directly performed without considering the first corresponding relationship between beam indication information and candidate transmission occasions. Similarly, the PUSCH is repeatedly transmitted, and at the same time multi-TRP transmission may be supported by means of allocation of RV parameters, which improves the reliability of data transmission.

[00161] Embodiments of a channel transmission apparatus corresponding to the embodiments of the channel transmission method are provided in the present disclosure.

[00162] FIG. 5 is a block diagram illustrating a channel transmission apparatus according to an embodiment. The apparatus includes a first determining module 310, a second determining module 320 and a transmitting module 330.

[00163] The first determining module 310 is configured to determine a mapping relationship between at least one basic RV sequence and a plurality of candidate transmission occasions for sending a physical uplink shared channel (PUSCH).

[00164] The second determining module 320 is configured to determine an actual RV sequence corresponding to each of the plurality of candidate transmission occasions based on the at least one basic RV sequence.

[00165] The transmitting module 330 is configured to repeatedly send a data block of the PUSCH on a plurality of target transmission occasions respectively based on actual RV sequences corresponding respectively to the plurality of target transmission occasions.

[00166] The embodiments of the apparatus refer to part descriptions of embodiments of the method since they correspond to the embodiments of the method. The embodiments of the apparatus described above are only schematic, in which the above units described as separate parts may or may not be physically separated, the parts shown as units may or may not be physical units, which may be located in one place, or may be distributed to multiple network units. Some or all modules may be selected according to the actual requirements to achieve the purpose of the present disclosure. Those skilled in the art may understand and implement it without any creative effort.

[00167] Accordingly, a computer-readable storage medium having a computer program stored thereon is provided in the present disclosure. The computer program is configured to

WHAT IS CLAIMED IS:

1. A channel transmission method performed by a terminal, comprising:

determining a mapping relationship between at least one basic redundancy version (RV) sequence and a plurality of candidate transmission occasions for sending a physical uplink shared channel (PUSCH);

determining an actual RV sequence corresponding to each of the plurality of candidate transmission occasions based on the at least one basic RV sequence; and

repeatedly sending a data block of the PUSCH on a plurality of target transmission occasions respectively based on actual RV sequences corresponding respectively to the plurality of target transmission occasions.

2. The method according to claim 1, wherein, determining the mapping relationship between the at least one basic RV sequence and the plurality of candidate transmission occasions for sending the PUSCH comprises:

determining the mapping relationship based on a first signaling sent by a base station; or

determining the mapping relationship based on a predefined configuration.

3. The method according to claim 1, wherein, determining the mapping relationship between the at least one basic RV sequence and the plurality of candidate transmission occasions for sending the PUSCH comprises:

determining a first corresponding relationship between different beam indication information received by different transmission and receiving points (TRPs) corresponding to a base station and the plurality of candidate transmission occasions; wherein the beam indication information is beam related information for sending the PUSCH; and

determining the mapping relationship based on the basic RV sequences corresponding to the different beam indication information and the first corresponding relationship.

4. The method according to claim 3, wherein, determining the actual RV sequence corresponding to the each of the plurality of candidate transmission occasions based on the at least one basic RV sequence comprises:

dividing the plurality of candidate transmission occasions into a plurality of groups; wherein each group of the candidate transmission occasions corresponds to a same beam indication information;

determining a basic RV sequence corresponding to each group of the candidate transmission occasions;

determining at least one of a start value or a sequence offset value of actual RV sequences corresponding to each group of the candidate transmission occasions; wherein, the sequence offset value is an RV sequence starting position from which each group of the candidate transmission occasions performs a circular mapping with regard to the basic RV sequence; and

determining a plurality of actual RV sequences corresponding to each group of the candidate transmission occasions based on the basic RV sequence corresponding to each group of the candidate transmission occasions and the at least one of the start value or the sequence offset value.

5. The method according to claim 4, wherein, determining the basic RV sequence corresponding to each group of the candidate transmission occasions comprises:

determining the basic RV sequence corresponding to each group of the candidate transmission occasions based on a second signaling sent by the base station; or,

determining the basic RV sequence corresponding to each group of the candidate transmission occasions based on a predefined configuration.

6. The method according to claim 4, wherein, determining the at least one of the start value or the sequence offset value of the actual RV sequences corresponding to each group of the candidate transmission occasions comprises:

determining the at least one of the start value or the sequence offset value of the actual RV sequences corresponding to each group of the candidate transmission occasions based on a specified information field comprised in downlink control information (DCI) sent by the base station.

7. The method according to claim 6, wherein, the specified information field is configured to independently indicate the start value of the actual RV sequences corresponding to each group of the candidate transmission occasions;

or, the specified information field is configured to indicate an RV codepoint of association information associated with the at least one of the start value or the sequence offset value of the actual RV sequences corresponding to each group of the candidate transmission occasions;

or, the specified information field is configured to indicate a start value of a first RV sequence relative to first beam indication information in the actual RV sequences corresponding to each

group of the candidate transmission occasions; wherein, an RV sequence corresponding to the first beam indication information is the first RV sequence.

8. The method according to claim 7, wherein, the specified information field is configured to indicate the RV codepoint of the association information associated with the at least one of the start value or the sequence offset value of the plurality of actual RV sequences;

determining the at least one of the start value or the sequence offset value of the actual RV sequences corresponding to each group of the candidate transmission occasions comprises at least one of:

determining the start value of the actual RV sequences corresponding to each group of the candidate transmission occasions that corresponds to the association information indicated by the specified information field based on a predetermined second corresponding relationship between RV codepoints and RV sequence start values; or

determining the sequence offset value of the actual RV sequences corresponding to each group of the candidate transmission occasions that corresponds to the association information indicated by the specified information field based on a predetermined third corresponding relationship between RV codepoints and sequence offset values.

9. The method according to claim 8, further comprising any one of:

acquiring the second corresponding relationship or the third corresponding relationship configured by the base station via a third signaling; or

determining the second corresponding relationship or the third corresponding relationship based on a predefined configuration.

10. The method according to claim 6, wherein, the specified information field is configured to indicate the start value of the first RV sequence relative to the first beam indication information in the actual RV sequences corresponding to each group of the candidate transmission occasions;

determining the start value of the actual RV sequences corresponding to each group of the candidate transmission occasions comprises:

determining an offset value of start values of other RV sequences in the actual RV sequences corresponding to each group of the candidate transmission occasions relative to the start value of the first RV sequence; and

determining the start values of the other RV sequences respectively based on the start value of the first RV sequence and the offset value.

11. The method according to claim 10, further comprising:

acquiring the offset value configured by the base station via a fourth signaling; or

determining the offset value based on a predefined configuration.

12. The method according to any one of claims 1 to 11, wherein, the plurality of candidate transmission occasions comprise K1 nominal transmission occasions; wherein, the K1 nominal transmission occasions are located within different slots respectively, start symbol positions of the K1 nominal transmission occasions within respective slots are same, and each slot contains a same number of continuous symbols; and

the plurality of target transmission occasions comprise a plurality of second transmission occasions, in response to a first transmission occasion existing in the K1 nominal transmission occasions; wherein, the first transmission occasion is a transmission occasion at which uplink PUSCH transmission is unable to be performed, and the plurality of second transmission occasions are transmission occasions at which uplink PUSCH transmission is able to be performed in the K1 nominal transmission occasions.

13. The method according to any one of claims 1 to 11, wherein the plurality of candidate transmission occasions comprise K1′ actual transmission occasions; wherein, the K1′ actual transmission occasions are transmission occasions at which uplink PUSCH transmission is able to be performed in K1 nominal transmission occasions, and the K1 nominal transmission occasions are located within different slots respectively, start symbol positions of the K1 nominal transmission occasions within respective slots are same, and each slot contains a same number of continuous symbols; and

the plurality of target transmission occasions comprise the K1′ actual transmission occasions.

14. The method according to any one of claims 1 to 11, wherein the plurality of candidate transmission occasions comprise K2′ actual transmission occasions; wherein, the K2′ actual transmission occasions are actual transmission occasions obtained by dividing K2 nominal transmission occasions, and the K2 nominal transmission occasions are back-to-back continuously allocated transmission occasions; and

the plurality of target transmission occasions comprise a plurality of second actual transmission occasions; wherein, the plurality of second actual transmission occasions are transmission occasions at which uplink PUSCH transmission is able to be performed in the K2′ actual transmission occasions.

15. The method according to any one of claims 1 to 11, wherein the plurality of candidate transmission occasions comprise K2″ actual transmission occasions; wherein, the K2″ actual transmission occasions are transmission occasions at which uplink PUSCH transmission is able to be performed in K2′ actual nominal transmission occasions; the K2′ actual transmission occasions are actual transmission occasions obtained by dividing K2 nominal transmission occasions; and the K2 nominal transmission occasions are back-to-back allocated continuous transmission occasions; and

the plurality of target transmission occasions comprise the K2″ actual transmission occasions.

16. The method according to claim 1 or 2, wherein, determining the mapping relationship between the at least one basic RV sequence and the plurality of candidate transmission occasions for sending the PUSCH comprises:

determining the mapping relationship between the at the least one basic RV sequence and all candidate transmission occasions for sending the PUSCH.

17. The method according to claim 16, wherein the all candidate transmission occasions comprise all nominal transmission occasions; wherein, the plurality of target transmission occasions comprise all actual transmission occasions at which uplink PUSCH transmission is able to be performed in the all nominal transmission occasions.

18. The method according to claim 16, wherein, the all candidate transmission occasions comprise all actual transmission occasions at which PUSCH transmission is able to be performed; and

the plurality of target transmission occasions comprise the all actual transmission occasions.

19. A computer-readable storage medium having a computer program stored thereon, wherein the computer program is configured to perform the method according to any one of claims 1 to 18.

20. A channel transmission apparatus, comprising:

a processor; and

a memory configured to store instructions executable by the processor;

wherein, the processor is configured to perform the method according to any one of claims 1 to 18.