

Claims

1. A wireless communication method, comprising:

determining, by a terminal device, a plurality of transmitting beams from transmitting beams of a network device, and determining a receiving beam matched with each transmitting
 5 beam of the plurality of transmitting beams in at least two receiving beam groups of the terminal device; and

transmitting, by the terminal device, a notification message to the network device, wherein the notification message is used for indicating the plurality of transmitting beams and the receiving beam matched with the each transmitting beam, and comprises information to be
 10 used by the network device for distinguishing a receiving beam group to which the receiving beam matched with the each transmitting beam belongs and distinguishing the receiving beam matched with the transmitting beam in the receiving beam group; wherein determining, by the terminal device, the plurality of transmitting beams from the transmitting beams of the network device, and determining, by the terminal device, the receiving beam matched with the each
 15 transmitting beam of the plurality of transmitting beams in the at least two receiving beam groups of the terminal device, comprises:

measuring, by the terminal device, downlink measurement signals transmitted by at least part of the transmitting beams of the network device by using at least part of receiving beams of each of the at least two receiving beam groups to obtain a measurement result; and

20 determining, by the terminal device, the plurality of transmitting beams and the receiving beam matched with the each transmitting beam of the plurality of transmitting beams in the at least two receiving beam groups according to the measurement result,

wherein the terminal device randomly selects the plurality of transmitting beams from beams whose beam quality exceeds a threshold; wherein, the downlink measurement signal is at
 25 least one of a synchronization signal, a channel state information reference signal, and a mobility related reference signal.

2. The method according to claim 1, wherein in the at least two receiving beam groups, different receiving beam groups correspond to different antenna panels of the terminal device.

3. The method according to claim 1 or 2, wherein the notification message carries identification information of the receiving beam matched with the each transmitting beam, and the identification information of each receiving beam carried by the notification message is different from identification information of other receiving beams included in the at least two receiving beam groups, to be used by the network device for distinguishing the receiving beam group to which the receiving beam matched with the each transmitting beam belongs and distinguishing the receiving beam matched with the transmitting beam in the receiving beam group;

or,

wherein the notification message carries identification information of the receiving beam group to which the receiving beam matched with the each transmitting beam belongs, and identification information of the receiving beam matched with the each transmitting beam in the receiving beam group to which the receiving beam belongs, to be used by the network device for distinguishing the receiving beam group to which the receiving beam matched with the each transmitting beam belongs and distinguishing the receiving beam matched with the transmitting beam in the receiving beam group.

4. The method according to any one of claims 1 to 3, wherein the plurality of transmitting beams comprise a plurality of first transmitting beams, a receiving beam matched with the plurality of first transmitting beams is a first receiving beam, and the first receiving beam is one receiving beam included in one of the at least two receiving beam groups;

the method further comprises:

receiving, by the terminal device, downlink signals simultaneously transmitted by the network device through the plurality of first transmitting beams, by using the first receiving beam.

5. The method according to claim 4, wherein before receiving the downlink signals simultaneously transmitted by the network device through the plurality of first transmitting beams, by using the first receiving beam, the method further comprises:

receiving, by the terminal device, first indication information, wherein the first indication information is used for indicating that the network device will simultaneously transmit the

downlink signals to the terminal device by using the plurality of first transmitting beams.

6. The method according to any one of claims 1 to 5, wherein receiving beams matched with the plurality of transmitting beams are a plurality of receiving beams, and different receiving beams in the plurality of receiving beams belong to different receiving beam groups;

5 the method further comprises:

receiving simultaneously, by the terminal device, downlink signals simultaneously transmitted by the network device through the plurality of transmitting beams, by using the plurality of receiving beams.

10 7. The method according to claim 6, wherein before receiving simultaneously the downlink signals simultaneously transmitted by the network device through the plurality of transmitting beams, by using the plurality of receiving beams, the method further comprises:

15 receiving, by the terminal device, second indication information, wherein the second indication information is used for indicating that the network device will simultaneously transmit the downlink signals to the terminal device by using the plurality of transmitting beams.

8. The method according to claim 1, wherein the notification message further carries a measurement result of measuring, by the terminal device, a downlink measurement signal transmitted by the each transmitting beam by using the receiving beam matched with the each transmitting beam of the plurality of transmitting beams.

20 9. A wireless communication method, comprising:

receiving, by a network device, a notification message transmitted by a terminal device, wherein the notification message is used for indicating a plurality of transmitting beams of the network device and a receiving beam matched with each transmitting beam of the plurality of transmitting beams in at least two receiving beam groups of the terminal device, and the
25 notification message comprises information to be used by the network device for distinguishing a receiving beam group to which the receiving beam matched with the each transmitting beam belongs and distinguishing the receiving beam matched with the transmitting beam in the receiving beam group;

determining, by the network device, the receiving beam matched with the each transmitting beam and determining a receiving beam group to which the receiving beam matched with the each transmitting beam belongs according to the notification message;

5 determining, by the network device, a plurality of target transmitting beams from the plurality of transmitting beams according to the receiving beam matched with the each transmitting beam and the receiving beam group to which the receiving beam matched with the each transmitting beam belongs; and

10 transmitting simultaneously, by the network device, downlink signals to the terminal device by using the plurality of target transmitting beams; wherein the notification message further carries a measurement result of measuring, by the terminal device, a downlink measurement signal transmitted by the each transmitting beam by using the receiving beam matched with the each transmitting beam of the plurality of transmitting beams,

15 wherein the network device determines a target transmitting beams from the plurality of transmitting beams according to a congestion situation of the each transmitting beam, a data amount of downlink data to be transmitted, and a measurement result for measuring the downlink measurement signal transmitted by the each transmitting beam by a beam pair consisted of the each transmitting beam and the receiving beam matched with the each transmitting beam; wherein, the downlink measurement signal is at least one of a synchronization signal, a channel state information reference signal, and a mobility related
20 reference signal.

10. The method according to claim 9, wherein different receiving beam groups of the terminal device correspond to different antenna panels of the terminal device.

11. The method according to claim 9 or 10, wherein the notification message carries identification information of the receiving beam matched with the each transmitting beam, and
25 the identification information of each receiving beam carried by the notification message is different from identification information of other receiving beams included in the at least two receiving beam groups;

determining, by the network device, the receiving beam matched with the each transmitting beam and determining the receiving beam group to which the receiving beam

matched with the each transmitting beam belongs according to the notification message comprises:

determining, by the network device, the receiving beam matched with the each transmitting beam and determining the receiving beam group to which the receiving beam
5 matched with the each transmitting beam belongs according to the identification information of the receiving beam matched with the each transmitting beam and preset information, wherein the preset information is used for indicating receiving beams included in the at least two receiving beam groups;

or,

10 wherein the notification message carries identification information of the receiving beam group to which the receiving beam matched with the each transmitting beam belongs, and identification information of the receiving beam matched with the each transmitting beam in the receiving beam group to which the receiving beam belongs;

determining, by the network device, the receiving beam matched with the each
15 transmitting beam and determining the receiving beam group to which the receiving beam matched with the each transmitting beam belongs according to the notification message; comprises:

determining, by the network device, the receiving beam matched with the each
20 transmitting beam and determining the receiving beam group to which the receiving beam matched with the each transmitting beam belongs according to the identification information of the receiving beam group to which the receiving beam matched with the each transmitting beam belongs and the identification information of the receiving beam matched with the each transmitting beam in the receiving beam group to which the receiving beam belongs.

12. The method according to any one of claims 9 to 11, wherein the plurality of target
25 transmitting beams are matched with a plurality of receiving beams, and different receiving beams in the plurality of receiving beams belong to different receiving beam groups;

or,

wherein the plurality of transmitting beams comprise a plurality of first transmitting

beams, a receiving beam matched with the plurality of first transmitting beams is a first receiving beam, and the first receiving beam is one receiving beam included in one of the at least two receiving beam groups.

13. The method according to any one of claims 9 to 12, wherein the method further
5 comprises:

transmitting, by the network device, indication information to the terminal device, wherein the indication information is used for indicating that the network device will simultaneously transmit the downlink signals to the terminal device by using the plurality of target transmitting beams.

10 14. A terminal device comprising a processing unit and a transceiving unit; wherein,

the processing unit is used for determining a plurality of transmitting beams from transmitting beams of a network device, and determining a receiving beam matched with each transmitting beam of the plurality of transmitting beams in at least two receiving beam groups of the terminal device;

15 the transceiving unit is used for transmitting a notification message to the network device, wherein the notification message is used for indicating the plurality of transmitting beams and the receiving beam matched with the each transmitting beam, and comprises information to be used by the network device for distinguishing a receiving beam group to which the receiving beam matched with the each transmitting beam belongs and distinguishing the receiving beam
20 matched with the transmitting beam in the receiving beam group; wherein the processing unit (410) is further used for:

measuring downlink measurement signals transmitted by at least part of the transmitting beams of the network device by using at least part of receiving beams of each of the at least two receiving beam groups to obtain a measurement result; and

25 determining the plurality of transmitting beams and the receiving beam matched with the each transmitting beam of the plurality of transmitting beams in the at least two receiving beam groups according to the measurement result,

wherein the processing unit (410) randomly selects the plurality of transmitting beams

from beams whose beam quality exceeds a threshold; wherein, the downlink measurement signal is at least one of a synchronization signal, a channel state information reference signal, and a mobility related reference signal.

15 15. The terminal device according to claim 14, wherein in the at least two receiving beam groups, different receiving beam groups correspond to different antenna panels of the terminal device.

10 16. The terminal device according to claim 14 or 15, wherein the notification message carries identification information of the receiving beam matched with the each transmitting beam, and the identification information of each receiving beam carried by the notification message is different from identification information of other receiving beams included in the at least two receiving beam groups, to be used by the network device for distinguishing the receiving beam group to which the receiving beam matched with the each transmitting beam belongs and distinguishing the receiving beam matched with the transmitting beam in the receiving beam group;

15 or,

wherein the notification message carries identification information of the receiving beam group to which the receiving beam matched with the each transmitting beam belongs, and identification information of the receiving beam matched with the each transmitting beam in the receiving beam group to which the receiving beam belongs, to be used by the network device
20 for distinguishing the receiving beam group to which the receiving beam matched with the each transmitting beam belongs and distinguishing the receiving beam matched with the transmitting beam in the receiving beam group.

25 17. The terminal device according to any one of claims 14 to 16, wherein the plurality of transmitting beams comprise a plurality of first transmitting beams, a receiving beam matched with the plurality of first transmitting beams is a first receiving beam, and the first receiving beam is one receiving beam included in one of the at least two receiving beam groups;

the transceiving unit is further used for:

receiving downlink signals simultaneously transmitted by the network device through the plurality of first transmitting beams, by using the first receiving beam.

18. The terminal device according to claim 17, wherein the transceiving unit is further used for:

receiving first indication information, wherein the first indication information is used for indicating that the network device will simultaneously transmit the downlink signals to the terminal device by using the plurality of first transmitting beams.

19. The terminal device according to any one of claims 14 to 18, wherein receiving beams matched with the plurality of transmitting beams are a plurality of receiving beams, and different receiving beams in the plurality of receiving beams belong to different receiving beam groups;

the transceiving unit is further used for:

receiving simultaneously downlink signals simultaneously transmitted by the network device through the plurality of transmitting beams, by using the plurality of receiving beams.

20. The terminal device according to claim 19, wherein the transceiving unit is further used for:

receiving second indication information, wherein the second indication information is used for indicating that the network device will simultaneously transmit the downlink signals to the terminal device by using the plurality of transmitting beams.

21. The terminal device according to claim 20, wherein the notification message further carries a measurement result of measuring, by the terminal device, a downlink measurement signal transmitted by the each transmitting beam by using the receiving beam matched with the each transmitting beam of the plurality of transmitting beams.

22. A network device comprising a transceiving unit and a processing unit; wherein, the transceiving unit is used for receiving a notification message transmitted by a terminal device, wherein the notification message is used for indicating a plurality of transmitting beams of the network device and a receiving beam matched with each transmitting beam of the plurality of transmitting beams in at least two receiving beam groups of the terminal device, and the notification message comprises information to be used by the network device for distinguishing a receiving beam group to which the receiving beam matched with the each

transmitting beam belongs and distinguishing the receiving beam matched with the transmitting beam in the receiving beam group;

the processing unit is used for determining the receiving beam matched with the each transmitting beam and determining a receiving beam group to which the receiving beam
 5 matched with the each transmitting beam belongs according to the notification message; and determining a plurality of target transmitting beams from the plurality of transmitting beams according to the receiving beam matched with the each transmitting beam and the receiving beam group to which the receiving beam matched with the each transmitting beam belongs;

the transceiving unit is further used for transmitting simultaneously downlink signals to
 10 the terminal device by using the plurality of target transmitting beams; wherein the notification message further carries a measurement result of measuring, by the terminal device, a downlink measurement signal transmitted by the each transmitting beam by using the receiving beam matched with the each transmitting beam of the plurality of transmitting beams,

wherein the processing unit (520) determines a target transmitting beams from the
 15 plurality of transmitting beams according to a congestion situation of the each transmitting beam, a data amount of downlink data to be transmitted, and a measurement result for measuring the downlink measurement signal transmitted by the each transmitting beam by a beam pair consisted of the each transmitting beam and the receiving beam matched with the each transmitting beam; wherein, the downlink measurement signal is at least one of a
 20 synchronization signal, a channel state information reference signal, and a mobility related reference signal.

23. The network device according to claim 22, wherein different receiving beam groups of the terminal device correspond to different antenna panels of the terminal device.

24. The network device according to claim 22 or 23, wherein the notification message
 25 carries identification information of the receiving beam matched with the each transmitting beam, and the identification information of each receiving beam carried by the notification message is different from identification information of other receiving beams included in the at least two receiving beam groups;

the processing unit is further used for:

determining the receiving beam matched with the each transmitting beam and determining the receiving beam group to which the receiving beam matched with the each transmitting beam belongs according to the identification information of the receiving beam matched with the each transmitting beam and preset information, wherein the preset information is used for
 5 indicating receiving beams included in the at least two receiving beam groups;

or,

wherein the notification message carries identification information of the receiving beam group to which the receiving beam matched with the each transmitting beam belongs, and identification information of the receiving beam matched with the each transmitting beam in the
 10 receiving beam group to which the receiving beam belongs;

the processing unit is further used for:

determining the receiving beam matched with the each transmitting beam and determining the receiving beam group to which the receiving beam matched with the each transmitting beam belongs according to the identification information of the receiving beam group to which the
 15 receiving beam matched with the each transmitting beam belongs and the identification information of the receiving beam matched with the each transmitting beam in the receiving beam group to which the receiving beam belongs.

25. The network device according to any one of claims 22 to 24, wherein the plurality of target transmitting beams are matched with a plurality of receiving beams, and different
 20 receiving beams in the plurality of receiving beams belong to different receiving beam groups;

or,

wherein the plurality of transmitting beams comprise a plurality of first transmitting beams, a receiving beam matched with the plurality of first transmitting beams is a first receiving beam, and the first receiving beam is one receiving beam included in one of the at
 25 least two receiving beam groups.

26. The network device according to any one of claims 22 to 25, wherein the processing unit is further used for:

transmitting indication information to the terminal device, wherein the indication

information is used for indicating that the network device will simultaneously transmit the downlink signals to the terminal device by using the plurality of target transmitting beams.