

CLAIMS

What is claimed is:

1. A beam failure recovery method, performed by a UE, wherein the method comprises:

5 determining, based on a measurement result of a target reference signal corresponding to a target physical downlink control channel PDCCH, whether a beam failure event occurs, wherein the target PDCCH comprises at least a first PDCCH repeatedly transmitted for K times, and $K \geq 2$; and

 reporting a beam failure recovery request to a network-side device;

10 wherein before the determining, based on a measurement result of a target reference signal corresponding to a target physical downlink control channel PDCCH, that a beam failure event occurs, the method further comprises:

 determining a reference signal resource set used for measurement, wherein the reference signal resource set comprises a resource of the target reference signal;

15 wherein the reference signal resource set comprises a first reference signal resource group corresponding to the first PDCCH;

 wherein reference signal resources in the first reference signal resource group satisfy at least one of the following:

20 in a case that the K transmissions of the first PDCCH correspond to K reference signal resources in the first reference signal resource group, and each reference signal resource corresponds to one piece of TCI state information, K pieces of TCI state information corresponding to the K reference signal resources are in a one-to-one correspondence with and the same as K pieces of TCI state information in the K transmissions;

25 in a case that the K transmissions of the first PDCCH correspond to one reference signal resource in the first reference signal resource group, and the one reference signal resource corresponds to K pieces of TCI state information, the K pieces of TCI state information corresponding to the one reference signal resource are in a one-to-one

correspondence with and the same as K pieces of TCI state information in the K transmissions; and

in a case that the K transmissions of the first PDCCH correspond to at least one reference signal resource in the first reference signal resource group, and each of the at least one reference signal resource corresponds to at least one piece of TCI state information, all TCI state information corresponding to the at least one reference signal resource is in a one-to-one correspondence with and the same as K pieces of TCI state information in the K transmissions.

2. The method according to claim 1, wherein

in a case that the first PDCCH is associated with N first CORESETs and that each first CORESET has one piece of TCI state information, the K pieces of TCI state information in the K transmissions comprise TCI state information of each first CORESET;

in a case that the first PDCCH is associated with one first CORESET and that the one first CORESET has a plurality of pieces of TCI state information, the K pieces of TCI state information in the K transmissions comprise each piece of TCI state information of the one first CORESET; or

in a case that the first PDCCH is associated with N first CORESETs and that at least one of the N first CORESETs has a plurality of pieces of TCI state information, the K pieces of TCI state information in the K transmissions comprise each piece of TCI state information of each first CORESET, wherein

N is an integer greater than 1.

3. The method according to claim 1, wherein reference signal resources in the first reference signal resource group are:

source RS resources indicated by TCI state information used in each of the K transmissions of the first PDCCH.

4. The method according to claim 3, wherein

in a case that the first PDCCH is associated with N first CORESETs and that each first CORESET has one piece of TCI state information, the source RS resources

comprise a part or all of source RS resources indicated by TCI state information of each first CORESET;

in a case that the first PDCCH is associated with one first CORESET and that the one first CORESET has a plurality of pieces of TCI state information, the source RS
5 resources comprise a part or all of source RS resources indicated by each piece of TCI state information of the one first CORESET; or

in a case that the first PDCCH is associated with N first CORESETs and that at least one of the N first CORESETs has a plurality of pieces of TCI state information, the source RS resources comprise a part or all of source RS resources indicated by each
10 piece of TCI state information of each first CORESET.

5. The method according to claim 1, wherein before the determining, based on a measurement result of a target reference signal corresponding to a target physical downlink control channel PDCCH, that a beam failure event occurs, the method further comprises:

15 determining a measurement result of the first reference signal resource group.

6. The method according to claim 5, wherein the measurement result of the first reference signal resource group comprises at least one of the following:

a measurement result of each reference signal resource in the first reference signal resource group;

20 a joint measurement result obtained by combining measurement results of all of at least one first reference signal resource;

a measurement result of each of at least one second reference signal resource; and

a joint measurement result obtained by combining measurement results of all of at least one second reference signal resource, wherein

25 the at least one first reference signal resource is at least one reference signal resource in the first reference signal resource group; and the at least one second reference signal resource is at least one reference signal resource in the first reference signal resource group, and each second reference signal resource corresponds to one or more pieces of TCI state information.

7. The method according to claim 6, wherein the first reference signal resource is a reference signal resource satisfying a second condition, wherein

the second condition comprises all reference signal resources in the first reference signal resource group, or reference signal resources corresponding to same TRP identification information, in the first reference signal resource group.

8. The method according to claim 5, wherein before the reporting a beam failure recovery request to a network-side device, the method further comprises:

in a case that the measurement result of the first reference signal resource group satisfies a first preset condition, determining that the beam failure event occurs.

9. The method according to claim 1, wherein the beam failure recovery request comprises information of Y third reference signal resources, wherein

the third reference signal resource is used for beam failure recovery; and

the Y third reference signal resources are candidate beam reference signal resources satisfying a third condition, in X groups of candidate beam reference signal resources; and each group of candidate beam reference signal resources comprises at least one candidate beam reference signal resource, and Y is a positive integer.

10. A terminal device, wherein the terminal device comprises a processor, a memory, and a computer program or an instruction stored in the memory and capable of running on the processor, wherein when the processor executes the computer program or the instruction, the following steps are implemented:

determining, based on a measurement result of a target reference signal corresponding to a target physical downlink control channel PDCCH, whether a beam failure event occurs, wherein the target PDCCH comprises at least a first PDCCH repeatedly transmitted for K times, and $K \geq 2$; and

reporting a beam failure recovery request to a network-side device;

wherein before the determining, based on a measurement result of a target reference signal corresponding to a target physical downlink control channel PDCCH, that a beam failure event occurs, when the processor executes the computer program or the instruction, the following steps are further implemented:

determining a reference signal resource set used for measurement, wherein the reference signal resource set comprises a resource of the target reference signal;

wherein the reference signal resource set comprises a first reference signal resource group corresponding to the first PDCCH;

5 wherein reference signal resources in the first reference signal resource group satisfy at least one of the following:

in a case that the K transmissions of the first PDCCH correspond to K reference signal resources in the first reference signal resource group, and each reference signal resource corresponds to one piece of TCI state information, K pieces of TCI state
10 information corresponding to the K reference signal resources are in a one-to-one correspondence with and the same as K pieces of TCI state information in the K transmissions;

in a case that the K transmissions of the first PDCCH correspond to one reference signal resource in the first reference signal resource group, and the one reference signal
15 resource corresponds to K pieces of TCI state information, the K pieces of TCI state information corresponding to the one reference signal resource are in a one-to-one correspondence with and the same as K pieces of TCI state information in the K transmissions; and

in a case that the K transmissions of the first PDCCH correspond to at least one
20 reference signal resource in the first reference signal resource group, and each of the at least one reference signal resource corresponds to at least one piece of TCI state information, all TCI state information corresponding to the at least one reference signal resource is in a one-to-one correspondence with and the same as K pieces of TCI state information in the K transmissions.

25 11. The terminal device according to claim 10, wherein

in a case that the first PDCCH is associated with N first CORESETs and that each first CORESET has one piece of TCI state information, the K pieces of TCI state information in the K transmissions comprise TCI state information of each first CORESET;

in a case that the first PDCCH is associated with one first CORESET and that the one first CORESET has a plurality of pieces of TCI state information, the K pieces of TCI state information in the K transmissions comprise each piece of TCI state information of the one first CORESET; or

- 5 in a case that the first PDCCH is associated with N first CORESETs and that at least one of the N first CORESETs has a plurality of pieces of TCI state information, the K pieces of TCI state information in the K transmissions comprise each piece of TCI state information of each first CORESET, wherein

N is an integer greater than 1.

- 10 12. The terminal device according to claim 10, wherein reference signal resources in the first reference signal resource group are:

source RS resources indicated by TCI state information used in each of the K transmissions of the first PDCCH.

13. The terminal device according to claim 12, wherein

- 15 in a case that the first PDCCH is associated with N first CORESETs and that each first CORESET has one piece of TCI state information, the source RS resources comprise a part or all of source RS resources indicated by TCI state information of each first CORESET;

- in a case that the first PDCCH is associated with one first CORESET and that the
20 one first CORESET has a plurality of pieces of TCI state information, the source RS resources comprise a part or all of source RS resources indicated by each piece of TCI state information of the one first CORESET; or

- in a case that the first PDCCH is associated with N first CORESETs and that at
least one of the N first CORESETs has a plurality of pieces of TCI state information,
25 the source RS resources comprise a part or all of source RS resources indicated by each piece of TCI state information of each first CORESET.

14. The terminal device according to claim 10, wherein before the determining, based on a measurement result of a target reference signal corresponding to a target physical downlink control channel PDCCH, that a beam failure event occurs, the
30 following steps are further implemented:

determining a measurement result of the first reference signal resource group.

15. The terminal device according to claim 14, wherein the measurement result of the first reference signal resource group comprises at least one of the following:

5 a measurement result of each reference signal resource in the first reference signal resource group;

a joint measurement result obtained by combining measurement results of all of at least one first reference signal resource;

a measurement result of each of at least one second reference signal resource; and

10 a joint measurement result obtained by combining measurement results of all of at least one second reference signal resource, wherein

the at least one first reference signal resource is at least one reference signal resource in the first reference signal resource group; and the at least one second reference signal resource is at least one reference signal resource in the first reference signal resource group, and each second reference signal resource corresponds to one or
15 more pieces of TCI state information.

16. The terminal device according to claim 15, wherein the first reference signal resource is a reference signal resource satisfying a second condition, wherein

the second condition comprises all reference signal resources in the first reference signal resource group, or reference signal resources corresponding to same TRP
20 identification information, in the first reference signal resource group.

17. The terminal device according to claim 14, wherein before the reporting a beam failure recovery request to a network-side device, the following steps are further implemented:

25 in a case that the measurement result of the first reference signal resource group satisfies a first preset condition, determining that the beam failure event occurs.

18. The terminal device according to claim 10, wherein the beam failure recovery request comprises information of Y third reference signal resources, wherein

the third reference signal resource is used for beam failure recovery; and

the Y third reference signal resources are candidate beam reference signal
30 resources satisfying a third condition, in X groups of candidate beam reference signal

resources; and each group of candidate beam reference signal resources comprises at least one candidate beam reference signal resource, and Y is a positive integer.

19. A beam failure recovery method, performed by a network-side device, wherein the method comprises:

- 5 sending indication information to UE, wherein the indication information indicates a reference signal resource set used for measurement, the reference signal resource set comprises a resource of a target reference signal corresponding to a target physical downlink control channel PDCCH, the target reference signal is used for beam failure detection, the target PDCCH comprises at least a first PDCCH repeatedly transmitted
10 for K times, and $K \geq 2$; and

 receiving a beam failure recovery request from the UE;

 wherein the sending indication information to UE comprises:

 sending the indication information to the UE according to a second predetermined rule;

- 15 wherein the reference signal resource set comprises a first reference signal resource group corresponding to the first PDCCH;

 wherein the second predetermined rule comprises:

 reference signal resources in the first reference signal resource group satisfy at least one of the following:

- 20 in a case that the K transmissions of the first PDCCH correspond to K reference signal resources in the first reference signal resource group, and each reference signal resource corresponds to one piece of TCI state information, K pieces of TCI state information corresponding to the K reference signal resources are in a one-to-one correspondence with and the same as K pieces of TCI state information in the K
25 transmissions;

 in a case that the K transmissions of the first PDCCH correspond to one reference signal resource in the first reference signal resource group, and the one reference signal resource corresponds to K pieces of TCI state information, the K pieces of TCI state information corresponding to the one reference signal resource are in a one-to-one

correspondence with and the same as K pieces of TCI state information in the K transmissions; and

in a case that the K transmissions of the first PDCCH correspond to at least one reference signal resource in the first reference signal resource group, and each of the at least one reference signal resource corresponds to at least one piece of TCI state information, all TCI state information corresponding to the at least one reference signal resource is in a one-to-one correspondence with and the same as K pieces of TCI state information in the K transmissions.

20. A network-side device, wherein the network-side device comprises a processor, a memory, and a computer program or an instruction stored in the memory and capable of running on the processor, wherein when the processor executes the computer program or the instruction, the following steps are implemented:

sending indication information to UE, wherein the indication information indicates a reference signal resource set used for measurement, the reference signal resource set comprises a resource of a target reference signal corresponding to a target physical downlink control channel PDCCH, the target reference signal is used for beam failure detection, the target PDCCH comprises at least a first PDCCH repeatedly transmitted for K times, and $K \geq 2$; and

receiving a beam failure recovery request from the UE;

wherein the sending indication information to UE comprises:

sending the indication information to the UE according to a second predetermined rule;

wherein the reference signal resource set comprises a first reference signal resource group corresponding to the first PDCCH;

wherein the second predetermined rule comprises:

reference signal resources in the first reference signal resource group satisfy at least one of the following:

in a case that the K transmissions of the first PDCCH correspond to K reference signal resources in the first reference signal resource group, and each reference signal resource corresponds to one piece of TCI state information, K pieces of TCI state

information corresponding to the K reference signal resources are in a one-to-one correspondence with and the same as K pieces of TCI state information in the K transmissions;

5 in a case that the K transmissions of the first PDCCH correspond to one reference signal resource in the first reference signal resource group, and the one reference signal resource corresponds to K pieces of TCI state information, the K pieces of TCI state information corresponding to the one reference signal resource are in a one-to-one correspondence with and the same as K pieces of TCI state information in the K transmissions; and

10 in a case that the K transmissions of the first PDCCH correspond to at least one reference signal resource in the first reference signal resource group, and each of the at least one reference signal resource corresponds to at least one piece of TCI state information, all TCI state information corresponding to the at least one reference signal resource is in a one-to-one correspondence with and the same as K pieces of TCI state
15 information in the K transmissions.