

CLAIMS

What is claimed is:

1. A communication method, comprising:

determining a first uplink resource, wherein the first uplink resource is located in a first time unit and carries first feedback information, and the first feedback information is feedback information corresponding to a semi-persistent scheduling SPS physical downlink shared channel PDSCH;

if time domain symbols occupied by the first uplink resource comprise a downlink symbol and/or a flexible symbol that is not indicated to be used for uplink transmission, determining a second time unit and a second uplink resource, wherein

the second uplink resource is located in the second time unit, all time domain symbols occupied by the second uplink resource are symbols used for uplink transmission, and a time domain start location of the second uplink resource is after a time domain start location of the first uplink resource; and

sending the first feedback information on the second uplink resource.

2. The method according to claim 1, wherein the second time unit is located after the first time unit, or the second time unit and the first time unit are a same time unit.

3. The method according to claim 2, wherein a relative location of the second uplink resource in the second time unit is the same as a relative location of the first uplink resource in the first time unit.

4. The method according to any one of claims 1 to 3, wherein a time domain width of the second uplink resource is equal to a time domain width of the first uplink resource, and/or a frequency domain width of the second uplink resource is equal to a frequency domain width of the first uplink resource.

5. The method according to any one of claims 1 to 4, wherein the determining a second time unit and a second uplink resource comprises:

determining the second time unit, wherein the second time unit is a candidate time unit with an earliest time domain location in one or more candidate time units, a time domain start location of each candidate time unit is not earlier than a time domain start location of the first time unit, and each candidate time unit meets a first condition and/or a second condition, wherein

the first condition is that an available SPS feedback resource exists, all time domain symbols of the available SPS feedback resource are symbols used for uplink transmission, a maximum value of a codebook bit interval corresponding to the available SPS feedback resource is greater than or equal to a quantity of feedback bits, and the quantity of feedback bits is a sum of a quantity of codebook bits of SPS feedback information in the candidate time unit and a quantity of codebook bits of the first feedback information; and the second condition is that an uplink signal exists, and the uplink signal comprises uplink data or dynamic feedback information; and

determining the second uplink resource in the second time unit.

6. The method according to claim 5, wherein the determining the second uplink resource in the second time unit comprises:

if the second time unit meets the first condition but does not meet the second condition, determining that an available SPS feedback resource in the second time unit is the second uplink resource; or

if the second time unit meets the second condition, determining that a resource that is in the second time unit and that carries the uplink signal is the second uplink resource.

7. The method according to claim 5 or 6, wherein a codebook bit interval corresponding to an available SPS feedback resource in the candidate time unit comprises a sum of a quantity of codebook bits of SPS feedback information in the candidate time unit and a quantity of codebook bits of the first feedback information; or

a minimum value of a codebook bit interval corresponding to an available SPS feedback resource in the candidate time unit is greater than a sum of a quantity of codebook bits of SPS feedback information in the candidate time unit and a quantity of codebook bits of the first feedback information.

8. The method according to any one of claims 1 to 7, wherein after the determining a second time unit and a second uplink resource, the method further comprises:

if a combination and sending condition is met, determining a third uplink resource, wherein the third uplink resource carries the first feedback information and second feedback information, wherein

the combination and sending condition is that the second time unit comprises the second feedback information, or the second uplink resource and a resource carrying the second feedback information overlap; and

sending the first feedback information and the second feedback information on the third uplink resource.

9. A communication method, comprising:

determining a first uplink resource, wherein the first uplink resource is located in a first time unit and carries first feedback information, and the first feedback information is feedback information corresponding to an SPS PDSCH;

if time domain symbols occupied by the first uplink resource comprise a downlink symbol and/or a flexible symbol that is not indicated to be used for uplink transmission, determining a second time unit and a second uplink resource, wherein

the second uplink resource is located in the second time unit, all time domain symbols occupied by the second uplink resource are symbols used for uplink transmission, and a time domain start location of the second uplink resource is after a time domain start location of the first uplink resource; and

receiving the first feedback information on the second uplink resource.

10. The method according to claim 9, wherein the second time unit is located after the first time unit, or the second time unit and the first time unit are a same time unit.

11. The method according to claim 10, wherein a relative location of the second uplink resource in the second time unit is the same as a relative location of the first uplink resource in the first time unit.

12. The method according to any one of claims 9 to 11, wherein a time domain width of the second uplink resource is equal to a time domain width of the first uplink resource, and/or a frequency domain width of the second uplink resource is equal to a frequency domain width of the first uplink resource.

13. The method according to any one of claims 9 to 12, wherein the determining a second time unit and a second uplink resource comprises:

determining the second time unit, wherein the second time unit is a candidate time unit with an earliest time domain location in one or more candidate time units, a time domain start location of each candidate time unit is not earlier than a time domain start location of the first time unit, and each candidate time unit meets a first condition and/or a second condition, wherein

the first condition is that an available SPS feedback resource exists, all time domain symbols of the available SPS feedback resource are symbols used for uplink transmission, a maximum

value of a codebook bit interval corresponding to the available SPS feedback resource is greater than or equal to a quantity of feedback bits, and the quantity of feedback bits is a sum of a quantity of codebook bits of SPS feedback information in the candidate time unit and a quantity of codebook bits of the first feedback information; and the second condition is that an uplink signal exists, and the uplink signal comprises uplink data or dynamic feedback information; and
5 determining the second uplink resource in the second time unit.

14. The method according to claim 13, wherein the determining the second uplink resource in the second time unit comprises:

if the second time unit meets the first condition but does not meet the second condition,
10 determining that an available SPS feedback resource in the second time unit is the second uplink resource; or

if the second time unit meets the second condition, determining that a resource that is in the second time unit and that carries the uplink signal is the second uplink resource.

15. The method according to claim 13 or 14, wherein a codebook bit interval corresponding
15 to an available SPS feedback resource in the candidate time unit comprises a sum of a quantity of codebook bits of SPS feedback information in the candidate time unit and a quantity of codebook bits of the first feedback information; or

a minimum value of a codebook bit interval corresponding to an available SPS feedback resource in the candidate time unit is greater than a sum of a quantity of codebook bits of SPS
20 feedback information in the candidate time unit and a quantity of codebook bits of the first feedback information.

16. The method according to any one of claims 9 to 15, wherein after the determining a second time unit and a second uplink resource, the method further comprises:

if a combination and receiving condition is met, determining a third uplink resource, wherein
25 the third uplink resource carries the first feedback information and second feedback information, wherein

the combination and receiving condition is that the second time unit comprises the second feedback information, or the second uplink resource and a resource carrying the second feedback information overlap; and

30 receiving the first feedback information and the second feedback information on the third uplink resource.

17. A communication apparatus, comprising a processing module and a transceiver module,
wherein

the processing module is configured to determine a first uplink resource, wherein the first
uplink resource is located in a first time unit and carries first feedback information, and the first
5 feedback information is feedback information corresponding to an SPS PDSCH;

the processing module is further configured to: if time domain symbols occupied by the first
uplink resource comprise a downlink symbol and/or a flexible symbol that is not indicated to be
used for uplink transmission, determine a second time unit and a second uplink resource, wherein

the second uplink resource is located in the second time unit, all time domain symbols
10 occupied by the second uplink resource are symbols used for uplink transmission, and a time
domain start location of the second uplink resource is after a time domain start location of the first
uplink resource; and

the transceiver module is configured to send the first feedback information on the second
uplink resource.

18. The apparatus according to claim 17, wherein the second time unit is located after the first
time unit, or the second time unit and the first time unit are a same time unit.

19. The apparatus according to claim 17 or 18, wherein the processing module is further
configured to determine the second time unit, wherein the second time unit is a candidate time unit
with an earliest time domain location in one or more candidate time units, a time domain start
20 location of each candidate time unit is not earlier than a time domain start location of the first time
unit, and each candidate time unit meets a first condition and/or a second condition, wherein

the first condition is that an available SPS feedback resource exists, all time domain symbols
of the available SPS feedback resource are symbols used for uplink transmission, a maximum
value of a codebook bit interval corresponding to the available SPS feedback resource is greater
25 than or equal to a quantity of feedback bits, and the quantity of feedback bits is a sum of a quantity
of codebook bits of SPS feedback information in the candidate time unit and a quantity of
codebook bits of the first feedback information; and the second condition is that an uplink signal
exists, and the uplink signal comprises uplink data or dynamic feedback information; and

the processing module is further configured to determine the second uplink resource in the
30 second time unit.

20. The apparatus according to claim 19, wherein the processing module is further configured

to: if the second time unit meets the first condition but does not meet the second condition, determine that an available SPS feedback resource in the second time unit is the second uplink resource; or

the processing module is further configured to: if the second time unit meets the second condition, determine that a resource that is in the second time unit and that carries the uplink signal is the second uplink resource.

21. The apparatus according to any one of claims 17 to 20, wherein the processing module is further configured to: if a combination and sending condition is met, determine a third uplink resource, wherein the third uplink resource carries the first feedback information and second feedback information, wherein

the combination and sending condition is that the second time unit comprises the second feedback information, or the second uplink resource and a resource carrying the second feedback information overlap; and

the transceiver module is further configured to send the first feedback information and the second feedback information on the third uplink resource.

22. A communication apparatus, comprising a processing module and a transceiver module, wherein

the processing module is configured to determine a first uplink resource, wherein the first uplink resource is located in a first time unit and carries first feedback information, and the first feedback information is feedback information corresponding to an SPS PDSCH;

the processing module is further configured to: if time domain symbols occupied by the first uplink resource comprise a downlink symbol and/or a flexible symbol that is not indicated to be used for uplink transmission, determine a second time unit and a second uplink resource, wherein

the second uplink resource is located in the second time unit, all time domain symbols occupied by the second uplink resource are symbols used for uplink transmission, and a time domain start location of the second uplink resource is after a time domain start location of the first uplink resource; and

the transceiver module is configured to receive the first feedback information on the second uplink resource.

23. The apparatus according to claim 22, wherein the second time unit is located after the first time unit, or the second time unit and the first time unit are a same time unit.

24. ~~The apparatus according to claim 22 or 23, wherein the processing module is further configured to determine the second time unit, wherein the second time unit is a candidate time unit with an earliest time domain location in one or more candidate time units, a time domain start location of each candidate time unit is not earlier than a time domain start location of the first time unit, and each candidate time unit meets a first condition and/or a second condition, wherein~~

~~the first condition is that an available SPS feedback resource exists, all time domain symbols of the available SPS feedback resource are symbols used for uplink transmission, a maximum value of a codebook bit interval corresponding to the available SPS feedback resource is greater than or equal to a quantity of feedback bits, and the quantity of feedback bits is a sum of a quantity of codebook bits of SPS feedback information in the candidate time unit and a quantity of codebook bits of the first feedback information; and the second condition is that an uplink signal exists, and the uplink signal comprises uplink data or dynamic feedback information; and~~

~~the processing module is further configured to determine the second uplink resource in the second time unit.~~

25. ~~The apparatus according to claim 24, wherein the processing module is further configured to: if the second time unit meets the first condition but does not meet the second condition, determine that an available SPS feedback resource in the second time unit is the second uplink resource; or~~

~~the processing module is further configured to: if the second time unit meets the second condition, determine that a resource that is in the second time unit and that carries the uplink signal is the second uplink resource.~~

26. ~~The apparatus according to any one of claims 22 to 25, wherein the processing module is further configured to: if a combination and receiving condition is met, determine a third uplink resource, wherein the third uplink resource carries the first feedback information and second feedback information, wherein~~

~~the combination and receiving condition is that the second time unit comprises the second feedback information, or the second uplink resource and a resource carrying the second feedback information overlap; and~~

~~the transceiver module is further configured to receive the first feedback information and the second feedback information on the third uplink resource.~~

~~27~~17. A communication apparatus, wherein the communication apparatus comprises a

processor and a transceiver, the transceiver is configured to implement information exchange between the communication apparatus and another communication apparatus, and the processor executes program instructions to perform the communication method according to any one of claims 1 to 16.

5 ~~28~~18. A computer-readable storage medium, wherein the computer-readable storage medium comprises a computer program or instructions, and when the computer program or the instructions are run on a computer, the computer is enabled to perform the communication method according to any one of claims 1 to 16.

10 ~~29~~19. A computer program product, wherein the computer program product comprises a computer program or instructions, and when the computer program or the instructions are run on a computer, the computer is enabled to perform the communication method according to any one of claims 1 to 16.