CLAIMS

What is claimed is:

1. A hybrid automatic repeat request-acknowledgement HARQ-ACK feedback method, applied to a terminal, wherein the method comprises:

determining, based on first information, a HARQ-ACK codebook corresponding to M downlink semi-persistent scheduling DL SPS configurations; wherein

the first information comprises at least one of the following: first HARQ-ACK feedback indication information, first time division duplexing TDD configuration information, and first dynamic slot format information; and $M \geq 1$, and M is an integer.

2. The method according to claim 1, wherein the method further comprises: determining, based on the first information, a time domain resource used for transmitting the HARQ-ACK codebook.

3. The method according to claim 1 or 2, wherein the determining, based on first information, a HARQ-ACK codebook corresponding to M DL SPS configurations comprises:

determining, based on a time domain resource indicated by the first HARQ-ACK feedback indication information, the HARQ-ACK codebook corresponding to the M DL SPS configurations; or

determining, based on a time domain resource indicated by the first HARQ-ACK feedback indication information, a HARQ-ACK codebook corresponding to M1 ones of the DL SPS configurations, wherein $1 \leq M1 < M$, and M1 is an integer.

4. The method according to claim 3, wherein the method further comprises:

in a case that the time domain resource indicated by the first HARQ-ACK feedback indication information collides with a downlink resource, skipping generating a HARQ-ACK codebook based on the time domain resource.

5. The method according to claim 1 or 2, wherein the determining, based on first information, a HARQ-ACK codebook corresponding to M DL SPS configurations comprises:

determining, based on a time domain resource indicated by the first TDD configuration information or by the first dynamic slot format information, the HARQ-ACK codebook corresponding to the M DL SPS configurations; or

determining, based on a time domain resource indicated by the first TDD configuration information or by the first dynamic slot format information, a HARQ-ACK codebook corresponding to M1 ones of the DL SPS configurations, wherein $1 \leq M1 < M$, and M1 is an integer.

~~6. The method according to claim 3 or 5, wherein~~

~~the M DL SPS configurations correspond to W priorities, wherein $1 \leq W \leq M$, and W is an integer; and/or~~

~~the M1 DL SPS configurations correspond to a first priority, wherein the first priority is one of the W priorities; and/or~~

~~the first HARQ-ACK feedback indication information corresponds to L priorities, wherein $L \geq 1$, and L is an integer.~~

~~7~~6. The method according to claim 1 or 2, wherein the determining, based on first information, a HARQ-ACK codebook corresponding to M DL SPS configurations comprises:

determining, based on a time domain resource indicated by the first information, a HARQ-ACK codebook corresponding to a DL SPS configuration j in the M DL SPS configurations; or

determining, based on a time domain resource indicated by the first information, a HARQ-ACK codebook corresponding to one group of DL SPS configurations in the M DL SPS configurations.

~~8. The method according to claim 7, wherein the first information comprises the first HARQ-ACK feedback indication information, and the first HARQ-ACK feedback indication information corresponds to a plurality of the DL SPS configurations.~~

~~9. The method according to claim 7, wherein the determining, based on first information, a HARQ-ACK codebook corresponding to M DL SPS configurations comprises:~~

~~determining, based on the time domain resource indicated by the first information and a HARQ-ACK feedback timing corresponding to the DL SPS configuration j, the HARQ-ACK codebook corresponding to the DL SPS configuration j; or~~

~~determining, based on the time domain resource indicated by the first information and a HARQ-ACK feedback timing set corresponding to the one group of DL SPS configurations, the HARQ-ACK codebook corresponding to the one group of DL SPS configurations.~~

~~10~~7. The method according to claim 1, wherein

the M DL SPS configurations correspond to W priorities, one HARQ-ACK codebook is generated for the M DL SPS configurations, and the one HARQ-ACK codebook comprises HARQ-ACK information corresponding to the M DL SPS configurations; or

the M DL SPS configurations correspond to W priorities, a maximum of W HARQ-ACK codebooks are generated for the M DL SPS configurations, and any one of the HARQ-ACK codebooks comprises HARQ-ACK information for a DL SPS configuration corresponding to a priority of the any one of the HARQ-ACK codebooks; wherein $1 \leq W \leq M$, and W is an integer.

~~11~~8. The method according to claim 1, wherein

the HARQ-ACK codebook comprises HARQ-ACK information, the HARQ-ACK information corresponds to a first SPS physical downlink shared channel PDSCH reception occasion between a time domain resource N0 and a time domain resource N1, and the first SPS PDSCH reception occasion corresponds to the M DL SPS configurations; or

the HARQ-ACK codebook comprises HARQ-ACK information of a first priority, the HARQ-ACK information of the first priority corresponds to a second SPS PDSCH reception occasion between the time domain resource N0 and the time domain resource N1, and the second SPS PDSCH reception occasion corresponds to a DL SPS configuration corresponding to the first priority in the M DL SPS configurations; or

the HARQ-ACK codebook comprises HARQ-ACK information of a first priority set, the HARQ-ACK information of the first priority set corresponds to a third SPS

PDSCH reception occasion between the time domain resource N0 and the time domain resource N1, and the third SPS PDSCH reception occasion corresponds to a DL SPS configuration corresponding to the first priority set in the M DL SPS configurations; or

the HARQ-ACK codebook comprises HARQ-ACK information for a first DL SPS configuration, the HARQ-ACK information for the first DL SPS configuration corresponds to a fourth SPS PDSCH reception occasion between the time domain resource N0 and the time domain resource N1, and the fourth SPS PDSCH reception occasion corresponds to the first DL SPS configuration in the M DL SPS configurations; or

the HARQ-ACK codebook comprises HARQ-ACK information for a first DL SPS configuration set, the HARQ-ACK information for the first DL SPS configuration set corresponds to a fifth SPS PDSCH reception occasion between the time domain resource N0 and the time domain resource N1, and the fifth SPS PDSCH reception occasion corresponds to the first DL SPS configuration set in the M DL SPS configurations; wherein

the time domain resource N0 and the time domain resource N1 are time domain resources for generating any HARQ-ACK codebook.

~~12. The method according to claim 11, wherein~~

~~there is no other time domain resource for generating a HARQ-ACK codebook between the time domain resource N0 and the time domain resource N1; or~~

~~there is another time domain resource for generating a HARQ-ACK codebook between the time domain resource N0 and the time domain resource N1, and there is an untransmitted HARQ-ACK codebook on the another time domain resource for generating a HARQ-ACK codebook.~~

~~13. The method according to claim 1, wherein the HARQ-ACK codebook comprises HARQ-ACK information, and the method further comprises:~~

~~in a case that there is no SPS PDSCH transmission in SPS PDSCH reception occasions corresponding to the HARQ-ACK information, skipping feeding back the HARQ-ACK codebook.~~

~~14~~9. The method according to claim 1, wherein the HARQ-ACK codebook comprises HARQ-ACK information, and the method further comprises:

in a case that there is no SPS PDSCH transmission in some of SPS PDSCH reception occasions corresponding to the HARQ-ACK information, skipping feeding back, in the HARQ-ACK codebook, target HARQ-ACK information, wherein the target HARQ-ACK information corresponds to the SPS PDSCH reception occasions with no SPS PDSCH transmission.

~~15. The method according to claim 2, wherein the method further comprises: determining, based on second information, whether to transmit the HARQ-ACK codebook on the time domain resource; wherein~~

~~the second information comprises at least one of the following: second HARQ-ACK feedback indication information, second TDD configuration information, second dynamic slot format information, uplink or downlink grant indication information, and/or a listen before talk LBT monitoring result of an unlicensed band.~~

~~16. The method according to claim 15, wherein the determining, based on second information, whether to transmit the HARQ-ACK codebook on the time domain resource comprises:~~

~~in a case that the time domain resource collides with a downlink time domain resource indicated by the second information, or that the second information indicates that the time domain resource is unavailable, skipping transmitting the HARQ-ACK codebook on the time domain resource or discarding transmission of the HARQ-ACK codebook.~~

~~17. The method according to claim 15, wherein the determining, based on second information, whether to transmit the HARQ-ACK codebook on the time domain resource comprises:~~

~~in a case that the time domain resource partially or completely overlaps an uplink time domain resource indicated by the second information, transmitting the HARQ-ACK codebook on the time domain resource.~~

~~18~~10. A HARQ-ACK feedback apparatus, comprising:

a determining module, configured to determine, based on first information, a HARQ-ACK codebook corresponding to M downlink semi-persistent scheduling DL SPS configurations; wherein

the first information comprises at least one of the following: first HARQ-ACK feedback indication information, first time division duplexing TDD configuration information, and first dynamic slot format information; and M ≥ 1, and M is an integer.

~~19~~11. The apparatus according to claim ~~18~~10, wherein the determining module is further configured to determine, based on the first information, a time domain resource used for transmitting the HARQ-ACK codebook.

~~20~~12. The apparatus according to claim 10~~18~~ or 11~~19~~, wherein the determining module is configured to:

determine, based on a time domain resource indicated by the first HARQ-ACK feedback indication information, the HARQ-ACK codebook corresponding to the M DL SPS configurations; or

determine, based on a time domain resource indicated by the first HARQ-ACK feedback indication information, a HARQ-ACK codebook corresponding to M1 ones of the DL SPS configurations, wherein 1 ≤ M1 < M, and M1 is an integer.

~~21~~13. The apparatus according to claim ~~20~~12, wherein the determining module is further configured to:

in a case that the time domain resource indicated by the first HARQ-ACK feedback indication information collides with a downlink resource, skip generating a HARQ-ACK codebook based on the time domain resource.

~~22~~14. The apparatus according to claim ~~18~~ 10 or ~~19~~11, wherein the determining module is configured to:

determine, based on a time domain resource indicated by the first TDD configuration information or by the first dynamic slot format information, the HARQ-ACK codebook corresponding to the M DL SPS configurations; or

determine, based on a time domain resource indicated by the first TDD configuration information or by the first dynamic slot format information, a HARQ-

ACK codebook corresponding to M1 ones of the DL SPS configurations, wherein 1 ≤ M1 < M, and M1 is an integer.

~~23. The apparatus according to claim 20 or 22, wherein~~

~~the M DL SPS configurations correspond to W priorities, wherein 1 ≤ W ≤ M, and W is an integer; and/or~~

~~the M1 DL SPS configurations correspond to a first priority, wherein the first priority is one of the W priorities; and/or~~

~~the first HARQ-ACK feedback indication information corresponds to L priorities, wherein L ≥ 1, and L is an integer.~~

~~24~~15. The apparatus according to claim ~~18~~ 10 or 11~~19~~, wherein the determining module is configured to:

determine, based on a time domain resource indicated by the first information, a HARQ-ACK codebook corresponding to a DL SPS configuration j in the M DL SPS configurations; or

determine, based on a time domain resource indicated by the first information, a HARQ-ACK codebook corresponding to one group of DL SPS configurations in the M DL SPS configurations.

~~25. The apparatus according to claim 24, wherein the first information comprises the first HARQ-ACK feedback indication information, and the first HARQ-ACK feedback indication information corresponds to a plurality of the DL SPS configurations.~~

~~26. The apparatus according to claim 24, wherein the determining module is configured to:~~

~~determine, based on the time domain resource indicated by the first information and a HARQ-ACK feedback timing corresponding to the DL SPS configuration j, the HARQ-ACK codebook corresponding to the DL SPS configuration j; or~~

~~determine, based on the time domain resource indicated by the first information and a HARQ-ACK feedback timing set corresponding to the one group of DL SPS configurations, the HARQ-ACK codebook corresponding to the one group of DL SPS configurations.~~

~~27~~16. The apparatus according to claim ~~18~~10, wherein

the M DL SPS configurations correspond to W priorities, one HARQ-ACK codebook is generated for the M DL SPS configurations, and the one HARQ-ACK codebook comprises HARQ-ACK information corresponding to the M DL SPS configurations; or

the M DL SPS configurations correspond to W priorities, a maximum of W HARQ-ACK codebooks are generated for the M DL SPS configurations, and any one of the HARQ-ACK codebooks comprises HARQ-ACK information for a DL SPS configuration corresponding to a priority of the any one of the HARQ-ACK codebooks; wherein $1 \leq W \leq M$, and W is an integer.

~~28~~17. The apparatus according to claim ~~18~~10, wherein

the HARQ-ACK codebook comprises HARQ-ACK information, the HARQ-ACK information corresponds to a first SPS physical downlink shared channel PDSCH reception occasion between a time domain resource N0 and a time domain resource N1, and the first SPS PDSCH reception occasion corresponds to the M DL SPS configurations; or

the HARQ-ACK codebook comprises HARQ-ACK information of a first priority, the HARQ-ACK information of the first priority corresponds to a second SPS PDSCH reception occasion between the time domain resource N0 and the time domain resource N1, and the second SPS PDSCH reception occasion corresponds to a DL SPS configuration corresponding to the first priority in the M DL SPS configurations; or

the HARQ-ACK codebook comprises HARQ-ACK information of a first priority set, the HARQ-ACK information of the first priority set corresponds to a third SPS PDSCH reception occasion between the time domain resource N0 and the time domain resource N1, and the third SPS PDSCH reception occasion corresponds to a DL SPS configuration corresponding to the first priority set in the M DL SPS configurations; or

the HARQ-ACK codebook comprises HARQ-ACK information for a first DL SPS configuration, the HARQ-ACK information for the first DL SPS configuration corresponds to a fourth SPS PDSCH reception occasion between the time domain resource N0 and the time domain resource N1, and the fourth SPS PDSCH reception

occasion corresponds to the first DL SPS configuration in the M DL SPS configurations; or

the HARQ-ACK codebook comprises HARQ-ACK information for a first DL SPS configuration set, the HARQ-ACK information for the first DL SPS configuration set corresponds to a fifth SPS PDSCH reception occasion between the time domain resource N0 and the time domain resource N1, and the fifth SPS PDSCH reception occasion corresponds to the first DL SPS configuration set in the M DL SPS configurations; wherein

the time domain resource N0 and the time domain resource N1 are time domain resources for generating any HARQ-ACK codebook.

~~29. The apparatus according to claim 28, wherein~~

~~there is no other time domain resource for generating a HARQ-ACK codebook between the time domain resource N0 and the time domain resource N1; or~~

~~there is another time domain resource for generating a HARQ-ACK codebook between the time domain resource N0 and the time domain resource N1, and there is an untransmitted HARQ-ACK codebook on the another time domain resource for generating a HARQ-ACK codebook.~~

~~30. The apparatus according to claim 18, wherein the HARQ-ACK codebook comprises HARQ-ACK information, and the determining module is further configured to:~~

~~in a case that there is no SPS PDSCH transmission in SPS PDSCH reception occasions corresponding to the HARQ-ACK information, skip feeding back the HARQ-ACK codebook.~~

~~31~~18. The apparatus according to claim ~~18~~10, wherein the HARQ-ACK codebook comprises HARQ-ACK information, and the determining module is further configured to:

in a case that there is no SPS PDSCH transmission in some of SPS PDSCH reception occasions corresponding to the HARQ-ACK information, skip feeding back, in the HARQ-ACK codebook, target HARQ-ACK information, wherein the target

HARQ-ACK information corresponds to the SPS PDSCH reception occasions with no SPS PDSCH transmission.

~~32. The apparatus according to claim 19, wherein the determining module is further configured to determine, based on second information, whether to transmit the HARQ-ACK codebook on the time domain resource; wherein~~

~~the second information comprises at least one of the following: second HARQ-ACK feedback indication information, second TDD configuration information, second dynamic slot format information, uplink or downlink grant indication information, and a listen before talk LBT monitoring result of an unlicensed band.~~

~~33. The apparatus according to claim 32, wherein the determining module is configured to:~~

~~in a case that the time domain resource collides with a downlink time domain resource indicated by the second information, or that the second information indicates that the time domain resource is unavailable, skip transmitting the HARQ-ACK codebook on the time domain resource or discard transmission of the HARQ-ACK codebook.~~

~~34. The apparatus according to claim 32, wherein the determining module is configured to:~~

~~in a case that the time domain resource partially or completely overlaps an uplink time domain resource indicated by the second information, transmit the HARQ-ACK codebook on the time domain resource.~~

~~35~~19. A terminal, comprising a processor, a memory, and a program or instructions stored in the memory and capable of running on the processor, wherein when the program or instructions are executed by the processor, the HARQ-ACK feedback method according to any one of claims 1 to ~~17~~ 9 is implemented.

~~36. A readable storage medium, wherein the readable storage medium stores a program or instructions, and when the program or instructions are executed by aprocessor, the HARQ-ACK feedback method according to any one of claims 1 to 17 is implemented.~~

~~37~~20. A chip, wherein the chip comprises a processor and a communication interface, the communication interface is coupled to the processor, and the processor is configured to run a program or instructions to implement the HARQ-ACK feedback method according to any one of claims 1 to ~~17~~9.