

CLAIMS

1. A method for transmitting an uplink control signal, comprising:
determining, by a terminal, a physical resource for transmitting the uplink control signal in a time-domain scheduling unit; and
transmitting, by the terminal, the uplink control signal to a network device on the physical resource, the uplink control signal being transmitted by use of a Cyclic Prefix-Orthogonal Frequency Division Multiplexing (CP-OFDM) waveform.
2. The method of claim 1, wherein the physical resource for transmitting the uplink control signal in the time-domain scheduling unit comprises at least one physical resource region, and different physical resource regions are used to transmit uplink control signals of different types.
3. The method of claim 2, wherein the at least one physical resource region comprises a first physical resource region for transmitting Acknowledgement, ACK/Negative Acknowledgement, NACK, signals and a second physical resource region for transmitting a Channel State Information, CSI, feedback signal.
4. The method of claim 3, wherein the at least one physical resource region further comprises a third physical resource region,
wherein the first, second, and third physical resource regions are overlapped, or
wherein the first, second, and third physical resource regions are continuous in time domain.
5. The method of claim 3, wherein the second physical resource region and the first physical resource region are continuous in time domain.
6. The method of claim 5, wherein a last OFDM symbol of the third physical resource region in the time domain is a last OFDM symbol in the time-domain scheduling unit.
7. The method of any one of claims 2-6, wherein physical resources for transmitting reference signals are configured in one of the at least one physical resource region.

8. The method of claim 7, wherein the physical resources for transmitting the reference signals are distributed in the frequency domain or the time domain.

9. The method of claim 7 or 8, wherein the uplink control signal comprises multiple Acknowledgement (ACK)/Negative Acknowledgement (NACK) signals, and

when physical resources for transmitting the reference signals are configured in the first physical resource region, in the first physical resource region, physical resources for transmitting the multiple ACK/NACK signals and the physical resources for transmitting the reference signals are not overlapped, and the physical resources in a resource group for transmitting the multiple ACK/NACK signals and the physical resources for transmitting the reference signals are staggered and continuously arranged in a same OFDM symbol.

10. The method of claim 7 or 8, wherein the uplink control signal further comprises a Channel State Information (CSI) feedback signal, and

when physical resources for transmitting the reference signals are configured in the second physical resource region, in the second physical resource transmission region, a physical resource for transmitting the CSI feedback signal and the physical resources for transmitting the reference signals are not overlapped, and the physical resources in the resource group for transmitting the reference signals are continuous in the time domain.

11. The method of claim 7 or 8, wherein the uplink control signal comprises the multiple ACK/NACK signals,

in the third physical resource region, the physical resources for transmitting the multiple ACK/NACK signals and physical resources for transmitting the reference signals are not overlapped.

12. The method of any one of claims 9-11, wherein the multiple ACK/NACK signals correspond to downlink data blocks in different time-domain scheduling units respectively, or

the multiple ACK/NACK signals correspond to different codewords of a same downlink data block.

13. The method of any one of claims 1-12, wherein determining, by the terminal, the physical resource for transmitting the uplink control signal in the time-domain scheduling unit comprises:

receiving, by the terminal, indication information transmitted by the network device, the indication information being used to indicate the physical resource for transmitting the uplink control signal in the time-domain scheduling unit.

14. The method of claim 13, wherein the indication information is further used to indicate a physical resource used by the terminal for transmitting uplink data in the time-domain scheduling unit.

15. The method of any one of claims 1-14, wherein the physical resources comprise resource elements, REs.

16. The method of any one of claims 2-14, wherein each of the physical resource regions comprises resource elements, REs, continuous in frequency region, and a plurality of Orthogonal Frequency Division Multiplexing, OFDM, signals.

17. The method of any of claims 1-16, wherein the time-domain scheduling unit is an uplink scheduling period or a slot.

18. A device for transmitting an uplink control signal, comprising:

a first determination module, configured to determine a physical resource for transmitting the uplink control signal in a time-domain scheduling unit; and

a transmitting module, configured to transmit the uplink control signal to a network device on the physical resource, the uplink control signal being transmitted by use of a Cyclic Prefix-Orthogonal Frequency Division Multiplexing (CP-OFDM) waveform.

19. The device of claim 18, wherein the physical resource for transmitting the uplink control signal in the time-domain scheduling unit comprises at least one physical resource region, and different physical resource regions are used to transmit uplink control signals of different types.

20. The device of claim 19, wherein the at least one physical resource region comprises a first physical resource region for transmitting Acknowledgement, ACK/Negative Acknowledgement, NACK, signals and a second physical resource region for transmitting a Channel State Information, CSI, feedback signal.

21. The device of any one of claim 20, wherein the at least one physical resource region further comprises a third physical resource region,

wherein the first, second, and third physical resource regions are overlapped, or

wherein the first, second, and third physical resource regions are continuous in time domain.

22. The device of claim 20, wherein the second physical resource region and the first physical resource region are continuous in time domain.

23. The device of claim 22, wherein a last OFDM symbol of the third physical resource region in the time domain is a last OFDM symbol in the time-domain scheduling unit.

24. The device of any one of claims 19-23, wherein physical resources for transmitting reference signals are configured in one of the at least one physical resource region.

25. The device of claim 24, wherein the physical resources for transmitting the reference signals are distributed in the frequency domain or the time domain.

26. The device of claim 24 or 25, wherein the uplink control signal comprises multiple Acknowledgement (ACK)/Negative Acknowledgement (NACK) signals, and

when physical resources for transmitting the reference signals are configured in the first physical resource region, in the first physical resource region, physical resources for transmitting the multiple ACK/NACK signals and the physical resources for transmitting the reference signals are not overlapped, and the physical resources in a resource group for transmitting the multiple ACK/NACK signals and the physical resources for transmitting the reference signals are staggered and continuously arranged in a same OFDM symbol.

27. The device of claim 24 or 25, wherein the uplink control signal further comprises a Channel State Information (CSI) feedback signal, and

when physical resources for transmitting the reference signals are configured in the second physical resource region, in the second physical resource transmission region, a physical resource for transmitting the CSI feedback signal and the physical resources for transmitting the reference signals are not overlapped, and the physical resources in the resource group for transmitting the reference signals are continuous in the time domain.

28. The device of claim 24 or 25, wherein the uplink control signal comprises the multiple ACK/NACK signals,

in the third physical resource region, the physical resources for transmitting the multiple ACK/NACK signals and physical resources for transmitting the reference signals are not overlapped.

29. The device of any one of claims 18-28, wherein the multiple ACK/NACK signals correspond to downlink data blocks in different time-domain scheduling units respectively, or

the multiple ACK/NACK signals correspond to different codewords of a same downlink data block.

30. The device of any one of claims 18-29, wherein the first determination module is configured to:

receive indication information transmitted by the network device, the indication information being used to indicate the physical resource for transmitting the uplink control signal in the time-domain scheduling unit.

31. The device of claim 30, wherein the indication information is further used to indicate a physical resource used by the terminal for transmitting uplink data in the time-domain scheduling unit.

32. The device of any one of claims 18-31, wherein the physical resources comprise resource elements, Res.

33. The device of any one of claims 19-31, wherein each of the physical resource regions comprises resource elements, REs, continuous in frequency region, and a plurality of Orthogonal Frequency Division Multiplexing, OFDM, signals.

34. The device of any one of claims 18-33, wherein the time-domain scheduling unit is an uplink scheduling period or a slot.