WHAT IS CLAIMED IS:

1. A method for transmitting data, performed by a terminal, comprising:

receiving schedule information sent by a base station in a physical downlink control channel (PDCCH), in which the schedule information is used to schedule a transmission of at least two transmission blocks;

obtaining a transmission narrow-band set of the at least two transmission blocks, in which the transmission narrow-band set includes at least two narrow-bands;

obtaining a size parameter of an alternating transmission unit, in which the alternating transmission unit is a data unit composed of multiple repeated transmissions of any one of the at least two transmission blocks, and the size parameter indicates a number of the repeated transmissions of the transmission block in the alternating transmission unit; and

performing an alternating frequency hopping transmission of the at least two transmission blocks with the base station based on the transmission narrow-band set and the size parameter;

wherein the alternating transmission blocks transmitted adjacently correspond to different transmission blocks, and one alternating frequency hopping transmission process supports transmission of at least two alternating transmission blocks of a same transmission block.

2. The method of claim 1, wherein, the at least two transmission blocks correspond to respective transmission narrow-band sets, each transmission narrow-band set includes at least two narrow-bands, performing the alternating frequency hopping transmission of the at least two transmission blocks with the base station based on the transmission narrow-band set and the size parameter comprises:

step a, transmitting with the base station an alternating transmission unit of a first target transmission block on a narrow-band of the transmission narrow-band set corresponding to the first target transmission block, in which the first target transmission block is any one of the at least two transmission blocks;

step b, after the transmission of the alternating transmission unit of the first target transmission block is completed, transmitting with the base station an alternating transmission unit of a second target transmission block on a narrow-band of the transmission narrow-band set corresponding to the second target transmission block, in which the second target transmission block is any one of remaining transmission blocks of the at least two transmission blocks;

step c, after one round of transmission of an alternating transmission unit of each of the at least two transmission blocks is completed, determining whether transmissions of all the alternating transmission units of each of the at least two transmission blocks are completed, if yes, stopping transmitting, or else performing steps a-b.

3. The method of claim 1, wherein the at least two transmission blocks correspond to a common transmission narrow-band set, performing the alternating frequency hopping transmission of the at least two transmission blocks with the base station based on the transmission narrow-band set and the size parameter comprises:

step a, transmitting with the base station an alternating transmission unit of a first transmission block on a first narrow-band of the transmission narrow-band set, in which the first transmission block is any one of the at least two transmission blocks and the first narrow-band is any one narrow-band in the transmission narrow-band set;

step b, after the transmission of the alternating transmission unit of the first transmission block is completed, transmitting with the base station an alternating transmission unit of a second transmission block on a second narrow-band different from the first narrow-band of the transmission narrow-band set, in which the second transmission block is any one of remaining transmission blocks of the at least two transmission blocks; and

step c, after one round of transmission of an alternating transmission unit of each of the at least two transmission blocks is completed, determining whether transmissions of all the alternating transmission units of each of the at least two transmission blocks are completed, if yes, stopping transmitting, or else performing steps a-b.

4. The method of any of claims 1-3, wherein obtaining the transmission narrow-band set of the at least two transmission blocks comprises:

obtaining a starting transmission narrow-band of the at least two transmission blocks contained in the schedule information;

obtaining a frequency hopping step size pre-configured by the base station for the terminal, in which the frequency hopping step size is used to indicate a narrow-band interval between two adjacent narrow-bands in the frequency hopping transmission;

obtaining at least two narrow-bands for the frequency hopping transmission of the at least two transmission blocks based on the starting transmission narrow-band and the frequency hopping step size; and

obtaining the transmission narrow-band set based on the at least two narrow-bands for the frequency hopping transmission of the at least two transmission blocks.

5. The method of any of claims 1-3, wherein obtaining the transmission narrow-band set of the at least two transmission blocks comprises:

obtaining the transmission narrow-band set of the at least two transmission blocks contained in the schedule information.

6. The method of any of claims 1-3, wherein obtaining the size parameter of the alternating transmission unit comprises:

obtaining a parameter value of a frequency hopping interval pre-configured by the base station, in which the parameter value is configured to indicate a number of repeated transmissions of one transmission block in each frequency hopping transmission; and

obtaining the parameter value as a value of the size parameter.

7. The method of any of claims 1-3, wherein obtaining the size parameter of the alternating transmission unit comprises:

obtaining the size parameter pre-configured by the base station via a broadcast signaling or a user specific signaling;

or

obtaining the size parameter sent by the base station via the PDCCH.

8. The method of claim 7, wherein obtaining the size parameter of the alternating transmission unit comprises:

performing the step of obtaining the size parameter pre-configured by the base station via the broadcast signaling or the user specific signaling or performing the step of obtaining the size parameter sent by the base station via the PDCCH when the base station pre-configures a parameter value of a frequency hopping interval for the terminal and the terminal does not activate the frequency hopping transmission.

9. The method of claim 8, wherein obtaining the size parameter of the alternating transmission unit further comprises:

obtaining the parameter value of the frequency hopping interval as the value of the size parameter when the base station pre-configures the parameter value of the frequency hopping interval for the terminal and the terminal activates the frequency hopping transmission.

10. The method of any of claims 1-3, wherein,

in a frequency division duplexing (FDD) coverage enhancement mode A, a value range of the size parameter is {1, 2, 4, 8};

in a frequency division duplexing (FDD) coverage enhancement mode B, a value range of the size parameter is {2, 4, 8, 16};

in a time division duplexing (TDD) coverage enhancement mode A, a value range of the size parameter is {1, 5, 10, 20};

in a time division duplexing (TDD) coverage enhancement mode B, a value range of the size parameter is {5, 10, 20, 40}.

11. A method for transmitting data, performed by a base station, comprising:

sending schedule information to a terminal in a physical downlink control channel (PDCCH), in which the schedule information is used to schedule a transmission of at least two transmission blocks;

obtaining a transmission narrow-band set of the at least two transmission blocks, in which the transmission narrow-band set includes at least two narrow-bands;

obtaining a size parameter of an alternating transmission unit, in which the alternating transmission unit is a data unit composed of multiple repeated transmissions of any one of the at least two transmission blocks, and the size parameter indicates a number of the repeated transmissions of the transmission block in the alternating transmission unit; and

performing an alternating frequency hopping transmission of the at least two transmission blocks with the terminal based on the transmission narrow-band set and the size parameter;

wherein the alternating transmission blocks transmitted adjacently correspond to different transmission blocks, and one alternating frequency hopping transmission process supports transmission of at least two alternating transmission blocks of a same transmission block.

12. The method of claim 11, wherein the at least two transmission blocks correspond to respective transmission narrow-band sets, each transmission narrow-band set includes at least two narrow-bands, performing the alternating frequency hopping transmission of the at least two transmission blocks with the terminal based on the transmission narrow-band set and the size parameter comprises:

step a, transmitting with the terminal an alternating transmission unit of a first target transmission block on a narrow-band of the transmission narrow-band set corresponding to the first target transmission block, in which the first target transmission block is any one of the at least two transmission blocks;

step b, after the transmission of the alternating transmission unit of the first target transmission block is completed, transmitting with the terminal an alternating transmission unit of a second target transmission block on a narrow-band of the transmission narrow-band set corresponding to the second target transmission block, in which the second target transmission block is any one of remaining transmission blocks of the at least two transmission blocks;

step c, after one round of transmission of an alternating transmission unit of each of the at least two transmission blocks is completed, determining whether transmissions of all the

alternating transmission units of each of the at least two transmission blocks are completed, if yes, stopping transmitting, or else performing steps a-b.

13. The method of claim 11, wherein the at least two transmission blocks correspond to a common transmission narrow-band set, performing the alternating frequency hopping transmission of the at least two transmission blocks with the terminal based on the transmission narrow-band set and the size parameter comprises:

step a, transmitting with the terminal an alternating transmission unit of a first transmission block on a first narrow-band of the transmission narrow-band set, in which the first transmission block is any one of the at least two transmission blocks and the first narrow-band is any one narrow-band in the transmission narrow-band set;

step b, after the transmission of the alternating transmission unit of the first transmission block is completed, transmitting with the terminal an alternating transmission unit of a second transmission block on a second narrow-band different from the first narrow-band of the transmission narrow-band set, in which the second transmission block is any one of remaining transmission blocks of the at least two transmission blocks;

step c, after one round of transmission of an alternating transmission unit of each of the at least two transmission blocks is completed, determining whether transmissions of all the alternating transmission units of each of the at least two transmission blocks are completed, if yes, stopping transmitting, or else performing steps a-b.

14. The method of any of claims 11-13, wherein obtaining the transmission narrow-band set of the at least two transmission blocks comprises:

obtaining a starting transmission narrow-band of the at least two transmission blocks;

obtaining a frequency hopping step size configured for the terminal, in which the frequency hopping step size is used to indicate a narrow-band interval between two adjacent narrow-bands in the frequency hopping transmission;

obtaining at least two narrow-bands for the frequency hopping transmission of the at least two transmission blocks based on the starting transmission narrow-band and the frequency hopping step size; and

obtaining the transmission narrow-band set based on the at least two narrow-bands for the frequency hopping transmission of the at least two transmission blocks.

15. The method of claim 14, before sending the schedule information to the terminal in the PDCCH, further comprising:

adding the transmission narrow-band set into the schedule information.

16. The method of any of claims 11-13, wherein obtaining the size parameter of the alternating transmission unit comprises:

obtaining a parameter value of a frequency hopping interval configured for the terminal when the frequency hopping interval is pre-configured for the terminal, in which the parameter value is configured to indicate a number of repeated transmissions of one transmission block in each frequency hopping transmission; and

obtaining the parameter value as a value of the size parameter.

17. The method of any of claims 11-13, wherein obtaining the size parameter of the alternating transmission unit comprises:

selecting a first value from a preset value set for the size parameter as a value of the size parameter when a frequency hopping interval is configured for the terminal and the terminal activates the frequency hopping transmission, in which the first value is the same as a parameter value of the frequency hopping interval;

selecting a second value from the preset value set for the size parameter as the value of the size parameter when the frequency hopping interval is not configured for the terminal or when the frequency hopping interval is configured for the terminal and the terminal does not activate the frequency hopping transmission, in which the second value is any value in the preset value set.

18. The method of claim 17, further comprising:

configuring the size parameter for the terminal via a broadcast signaling or a user specific signaling;

or

sending the size parameter to the terminal via the PDCCH.

19. The method of any of claims 11-13, wherein,

in a frequency division duplexing (FDD) coverage enhancement mode A, a value range of the size parameter is {1, 2, 4, 8};

in a frequency division duplexing (FDD) coverage enhancement mode B, a value range of the size parameter is {2, 4, 8, 16};

in a time division duplexing (TDD) coverage enhancement mode A, a value range of the size parameter is {1, 5, 10, 20};

in a time division duplexing (TDD) coverage enhancement mode B, a value range of the size parameter is {5, 10, 20, 40}.

~~20. An apparatus for transmitting data, applicable in a terminal, comprising:~~

~~a schedule information receiving module, configured to receive schedule information sent by a base station in a physical downlink control channel (PDCCH), in which the schedule information is used to schedule a transmission of at least two transmission blocks;~~

~~a narrow-band set obtaining module, configured to obtain a transmission narrow-band set of the at least two transmission blocks, in which the transmission narrow-band set includes at least two narrow-bands;~~

~~a size parameter obtaining module, configured to obtain a size parameter of an alternating transmission unit, in which the alternating transmission unit is a data unit composed of multiple repeated transmissions of any one of the at least two transmission blocks, and the size parameter indicates a number of the repeated transmissions of the transmission block in the alternating transmission unit; and~~

~~a transmitting module, configured to perform an alternating frequency hopping transmission of the at least two transmission blocks with the base station based on the transmission narrow-band set and the size parameter.~~

~~21. The apparatus of claim 20, wherein, the at least two transmission blocks correspond to respective transmission narrow-band sets, each transmission narrow-band set includes at least two narrow-bands, the transmitting module is configured to perform following steps comprising:~~

~~step a, transmitting with the base station an alternating transmission unit of a first target transmission block on a narrow-band of the transmission narrow-band set corresponding to the first target transmission block, in which the first target transmission block is any one of the at least two transmission blocks;~~

~~step b, after the transmission of the alternating transmission unit of the first target transmission block is completed, transmitting with the base station an alternating transmission unit of a second target transmission block on a narrow-band of the transmission narrow-band set corresponding to the second target transmission block, in which the second target transmission block is any one of remaining transmission blocks of the at least two transmission blocks;~~

~~step c, after one round of transmission of an alternating transmission unit of each of the at least two transmission blocks is completed, determining whether transmissions of all the alternating transmission units of each of the at least two transmission blocks are completed, if yes, stopping transmitting, or else performing steps a-b.~~

~~22. The apparatus of claim 20, wherein the at least two transmission blocks correspond to a common transmission narrow-band set, the transmitting module is configured to perform following steps comprising:~~

~~step a, transmitting with the base station an alternating transmission unit of a first transmission block on a first narrow-band of the transmission narrow-band set, in which the first transmission block is any one of the at least two transmission blocks and the first narrow-band is any one narrow-band in the transmission narrow-band set;~~

~~step b, after the transmission of the alternating transmission unit of the first transmission block is completed, transmitting with the base station an alternating transmission unit of a second transmission block on a second narrow-band different from the first narrow-band of the transmission narrow-band set, in which the second~~

transmission block is any one of remaining transmission blocks of the at least two transmission blocks; and

step c, after one round of transmission of an alternating transmission unit of each of the at least two transmission blocks is completed, determining whether transmissions of all the alternating transmission units of each of the at least two transmission blocks are completed, if yes, stopping transmitting, or else performing steps a-b.

23. The apparatus of any of claims 20-22, wherein the narrow-band set obtaining module is configured to:

obtain a starting transmission narrow-band of the at least two transmission blocks contained in the schedule information;

obtain a frequency hopping step size pre-configured by the base station for the terminal, in which the frequency hopping step size is used to indicate a narrow-band interval between two adjacent narrow-bands in the frequency hopping transmission;

obtain at least two narrow-bands for the frequency hopping transmission of the at least two transmission blocks based on the starting transmission narrow-band and the frequency hopping step size; and

obtain the transmission narrow-band set based on the at least two narrow-bands for the frequency hopping transmission of the at least two transmission blocks.

24. The apparatus of any of claims 20-22, wherein the narrow-band set obtaining module is configured to:

obtain the transmission narrow-band set of the at least two transmission blocks contained in the schedule information.

25. The apparatus of any of claims 20-22, wherein the size parameter obtaining module is configured to:

obtain a parameter value of a frequency hopping interval pre-configured by the base station, in which the parameter value is configured to indicate a number of repeated transmissions of one transmission block in each frequency hopping transmission; and

obtain the parameter value as a value of the size parameter.

26. The apparatus of any of claims 20-22, wherein the size parameter obtaining module is configured to:

obtain the size parameter pre-configured by the base station via a broadcast signaling or a user specific signaling;

or

obtain the size parameter sent by the base station via the PDCCH.

27. The apparatus of claim 25, wherein the size parameter obtaining module is configured to:

perform the step of obtaining the size parameter pre-configured by the base station via a broadcast signaling or a user specific signaling or perform the step of obtaining the size parameter sent by the base station via the PDCCH when the base station pre-configures a parameter value of a frequency hopping interval for the terminal and the terminal does not activate the frequency hopping transmission.

28. The apparatus of claim 27, wherein the size parameter obtaining module is configured to:

obtain the parameter value of the frequency hopping interval as the value of the size parameter when the base station pre-configures the parameter value of the frequency hopping interval for the terminal and the terminal activates the frequency hopping transmission.

29. The apparatus of any of claims 20-22, wherein,

in a frequency division duplexing (FDD) coverage enhancement mode A, a value range of the size parameter is {1, 2, 4, 8};

in a frequency division duplexing (FDD) coverage enhancement mode B, a value range of the size parameter is {2, 4, 8, 16};

in a time division duplexing (TDD) coverage enhancement mode A, a value range of the size parameter is {1, 5, 10, 20};

in a time division duplexing (TDD) coverage enhancement mode B, a value range of the size parameter is {5, 10, 20, 40}.

30. An apparatus for transmitting data, applicable in a base station, comprising:

a schedule information sending module, configured to send schedule information to

a terminal in a physical downlink control channel (PDCCH), in which the schedule information is used to schedule a transmission of at least two transmission blocks;

a narrow-band set obtaining module, configured to obtain a transmission narrow-band set of the at least two transmission blocks, in which the transmission narrow-band set includes at least two narrow-bands;

a size parameter obtaining module, configured to obtain a size parameter of an alternating transmission unit, in which the alternating transmission unit is a data unit composed of multiple repeated transmissions of any one of the at least two transmission blocks, and the size parameter indicates a number of the repeated transmissions of the transmission block in the alternating transmission unit; and

a transmitting module, configured to perform an alternating frequency hopping transmission of the at least two transmission blocks with the terminal based on the transmission narrow-band set and the size parameter.

31. The apparatus of claim 30, wherein the at least two transmission blocks correspond to respective transmission narrow-band sets, each transmission narrow-band set includes at least two narrow-bands, the narrow-band set obtaining module is configured to perform the following steps comprising:

step a, transmitting with the terminal an alternating transmission unit of a first target transmission block on a narrow-band of the transmission narrow-band set corresponding to the first target transmission block, in which the first target transmission block is any one of the at least two transmission blocks;

step b, after the transmission of the alternating transmission unit of the first target transmission block is completed, transmitting with the terminal an alternating transmission unit of a second target transmission block on a narrow-band of the transmission narrow-band set corresponding to the second target transmission block, in which the second target transmission block is any one of remaining transmission blocks of the at least two transmission blocks;

step c, after one round of transmission of an alternating transmission unit of each of the at least two transmission blocks is completed, determining whether transmissions of all the alternating transmission units of each of the at least two transmission blocks are completed, if

yes, stopping transmitting, or else performing steps a-b.

32. The apparatus of claim 30, wherein the at least two transmission blocks correspond to a common transmission narrow-band set, the narrow-band set obtaining module is configured to perform the following steps comprising:

step a, transmitting with the terminal an alternating transmission unit of a first transmission block on a first narrow-band of the transmission narrow-band set, in which the first transmission block is any one of the at least two transmission blocks and the first narrow-band is any one narrow-band in the transmission narrow-band set;

step b, after the transmission of the alternating transmission unit of the first transmission block is completed, transmitting with the terminal an alternating transmission unit of a second transmission block on a second narrow-band different from the first narrow-band of the transmission narrow-band set, in which the second transmission block is any one of remaining transmission blocks of the at least two transmission blocks;

step c, after one round of transmission of an alternating transmission unit of each of the at least two transmission blocks is completed, determining whether transmissions of all the alternating transmission units of each of the at least two transmission blocks are completed, if yes, stopping transmitting, or else performing steps a-b.

33. The apparatus of any of claims 30-32, wherein the narrow-band set obtaining module is configured to:

obtain a starting transmission narrow-band of the at least two transmission blocks;

obtain a frequency hopping step size configured for the terminal, in which the frequency hopping step size is used to indicate a narrow-band interval between two adjacent narrow-bands in the frequency hopping transmission;

obtain at least two narrow-bands for the frequency hopping transmission of the at least two transmission blocks based on the starting transmission narrow-band and the frequency hopping step size; and

obtain the transmission narrow-band set based on the at least two narrow-bands for the frequency hopping transmission of the at least two transmission blocks.

34. The apparatus of claim 33, further comprising:

an adding module, configured to add the transmission narrow-band set into the schedule information before the schedule information sending module sends the schedule information to the terminal in the PDCCH, further comprising.

35. The apparatus of any of claims 30-32, wherein the size parameter obtaining module is configured to:

obtain a parameter value of a frequency hopping interval configured for the terminal when the frequency hopping interval is pre-configured for the terminal, in which the parameter value is configured to indicate a number of repeated transmissions of one transmission block in each frequency hopping transmission; and

obtain the parameter value as a value of the size parameter.

36. The apparatus of any of claims 30-32, wherein the size parameter obtaining module is configured to:

select a first value from a preset value set for the size parameter as a value of the size parameter when a frequency hopping interval is configured for the terminal and the terminal activates the frequency hopping transmission, in which the first value is the same as a parameter value of the frequency hopping interval;

select a second value from the preset value set for the size parameter as the value of the size parameter when the frequency hopping interval is not configured for the terminal or when the frequency hopping interval is configured for the terminal and the terminal does not activate the frequency hopping transmission, in which the second value is any value in the preset value set.

37. The apparatus of claim 36, further comprising:

a configuring module, configured to configure the size parameter for the terminal via a broadcast signaling or a user specific signaling;

or

a sending module, configured to send the size parameter to the terminal via the PDCCH.

38. The apparatus of any of claims 30-32, wherein,

~~in a frequency division duplexing (FDD) coverage enhancement mode A, a value range of the size parameter is {1, 2, 4, 8};~~

~~in a frequency division duplexing (FDD) coverage enhancement mode B, a value range of the size parameter is {2, 4, 8, 16};~~

~~in a time division duplexing (TDD) coverage enhancement mode A, a value range of the size parameter is {1, 5, 10, 20};~~

~~in a time division duplexing (TDD) coverage enhancement mode B, a value range of the size parameter is {5, 10, 20, 40}.~~

~~39. A data transmission system, comprising a terminal and a base station; wherein,~~

~~the terminal comprises the apparatus for transmitting data according to any of claims 20-29; and~~

~~the base station comprises the apparatus for transmitting data according to any of claims 30-38.~~

~~40~~20. A device for transmitting data, applicable in a terminal, comprising:

a processor; and

memory configured to store instructions executable by the processor;

wherein the processor is configured to perform the method according to any of claims 1-10.~~:~~

~~receive schedule information sent by a base station in a physical downlink control channel (PDCCH), in which the schedule information is used to schedule a transmission of at least two transmission blocks;~~

~~obtain a transmission narrow-band set of the at least two transmission blocks, in which the transmission narrow-band set includes at least two narrow-bands;~~

~~obtain a size parameter of an alternating transmission unit, in which the alternating transmission unit is a data unit composed of multiple repeated transmissions of any one of the at least two transmission blocks, and the size parameter indicates a number of the repeated transmissions of the transmission block in the alternating transmission unit; and~~

~~perform an alternating frequency hopping transmission of the at least two transmission blocks with the base station based on the transmission narrow-band set and the size parameter.~~

~~41~~21. A device for transmitting data, applicable in a base station, comprising:

a processor; and

memory configured to store instructions executable by the processor;

wherein the processor is configured to perform the method according to any of claims 11-19.~~:~~

~~send schedule information to a terminal in a physical downlink control channel (PDCCH), in which the schedule information is used to schedule a transmission of at least two transmission blocks;~~

~~obtain a transmission narrow-band set of the at least two transmission blocks, in which the transmission narrow-band set includes at least two narrow-bands;~~

~~obtain a size parameter of an alternating transmission unit, in which the alternating transmission unit is a data unit composed of multiple repeated transmissions of any one of the at least two transmission blocks, and the size parameter indicates a number of the repeated transmissions of the transmission block in the alternating transmission unit; and~~

~~perform an alternating frequency hopping transmission of the at least two transmission blocks with the terminal based on the transmission narrow-band set and the size parameter.~~

~~42~~22. A computer-readable storage medium, comprising executable instructions, wherein when the executable instructions are called by a processor in a terminal, the processor is caused to implement the method for transmitting data according to any of claims 1-10.

~~43~~23. A computer-readable storage medium, comprising executable instructions, wherein when the executable instructions are called by a processor in a base station, the processor is caused to implement the method for transmitting data according to any of claims 11-19.