WHAT IS CLAIMED IS:

1. A data transmission method, comprising:

determining configuration information of at least one flexible sub-frame comprised in a Time Division Duplex (TDD) radio frame, wherein the flexible sub-frame is configured to comprise at least one uplink transmission symbol and at least one downlink transmission symbol, and sub-timeslots occupied by the uplink transmission symbol and the downlink transmission symbol are alternately configured;

delivering the determined configuration information of the at least one flexible sub-frame to a user equipment (UE) by using signaling; and

according to the determined configuration information of the at least one flexible sub-frame, receiving uplink data in the time slot of the uplink transmission symbol and sending downlink data in the time slot of the downlink transmission symbol.

2. The method of claim 1, wherein the flexible sub-frame is configured to further comprise a Guard Period (GP), wherein the GP is located between a downlink transmission symbol and an uplink transmission symbol when the downlink transmission symbol is transformed to the uplink transmission symbol.

3. The method of claim 2, wherein the GP is configured to be located between a downlink transmission symbol and an uplink transmission symbol in a same flexible sub-frame when the downlink transmission symbol is transformed to the uplink transmission symbol; or

the GP is configured to be located between a downlink transmission symbol and an uplink transmission symbol in adjacent flexible sub-frames when the downlink transmission symbol is transformed to the uplink transmission symbol.

4. The method of claim 1 or 2, wherein determining configuration information of at least one flexible sub-frame comprised in a TDD radio frame comprises:

for each flexible sub-frame, determining a location and a time length of a sub-timeslot

that is occupied by each uplink transmission symbol and a location and a time length of a sub-timeslot that is occupied by each downlink transmaission symbol; and

when the flexible sub-frame is configured to further comprise a GP, determining a location and a time length of a sub-timeslot that is occupied by the GP.

5. The method of claim 1 or 2, wherein the at least one flexible sub-frame comprises a dynamically configured flexible sub-frame, and determining configuration information of the dynamically configured flexible sub-frame comprises:

periodically determining a location, occupation information, and a time length of each sub-timeslot in the dynamically configured flexible sub-frame.

6. The method of claim 1 or 2, wherein the at least one flexible sub-frame comprises a semi-dynamically configured flexible sub-frame, the semi-dynamically configured flexible sub-frame comprises a fixedly configured timeslot and a flexibly configured timeslot, and determining configuration information of the semi-dynamically configured flexible sub-frame comprises:

at a first predetermined periodicity, determining a location, occupation information, and a time length of each fixedly configured timeslot in the semi-dynamically configured flexible sub-frame; and

at a second predetermined periodicity, determining a location, occupation information, and a time length of each flexibly configured timeslot in the semi-dynamically configured flexible sub-frame, wherein

the first predetermined periodicity is larger than the second predetermined periodicity.

7. The method of claim 1 or 2, wherein the signaling comprises broadcast signaling, Radio Resource Control (RRC) signaling, and physical layer signaling.

8. A data transmission method, comprising:

receiving, from a base station, configuration information of at least one flexible

sub-frame comprised in a Time Division Duplex (TDD) radio frame, wherein the flexible sub-frame is configured to comprise at least one uplink transmission symbol and at least one downlink transmission symbol, and sub-timeslots occupied by the uplink transmission symbol and the downlink transmission symbol are alternately configured; and

according to the configuration information of the at least one flexible sub-frame comprised in the TDD radio frame, sending uplink data in the time slot of the uplink transmission symbol, and receiving downlink data in the time slot of the downlink transmission symbol.

9. The method of claim 8, wherein the flexible sub-frame is configured to further comprise a Guard Period (GP), wherein the GP is located between a downlink transmission symbol and an uplink transmission symbol when the downlink transmission symbol is transformed to the uplink transmission symbol.

10. The method of claim 9, wherein the GP is configured to be located between a downlink transmission symbol and an uplink transmission symbol in a same flexible sub-frame when the downlink transmission symbol is transformed to the uplink transmission symbol; or
the GP is configured to be located between a downlink transmission symbol and an uplink transmission symbol in adjacent flexible sub-frames when the downlink transmission symbol is transformed to the uplink transmission symbol.

11. The method of claim 8 or 9, wherein the at least one flexible sub-frame comprises dynamically configured flexible sub-frame, and receiving configuration information of at least one flexible sub-frame comprised in a TDD radio frame from a base station comprises:

periodically receiving, from the base station, structure information of the at least one dynamically configured flexible sub-frame in the TDD radio frame, wherein a location, occupation information, and a time length of each sub-timeslot in the dynamically configured flexible sub-frame are periodically and dynamically configured.

12. The method of claim 8 or 9, wherein the at least one flexible sub-frame comprises semi-dynamically configured flexible sub-frame, the semi-dynamically configured flexible sub-frame comprises a fixedly configured timeslot and a flexibly configured timeslot, and receiving configuration information of at least one flexible sub-frame comprised in a TDD radio frame from a base station comprises:

at a first predetermined periodicity, receiving, from the base station, configuration information of a location, occupation information, and a time length of each fixedly configured timeslot in the at least one semi-dynamically configured flexible sub-frame in the radio frame; and

at a second predetermined periodicity, receiving, from the base station, configuration information of a location, occupation information, and a time length of each flexibly configured timeslot in the at least one semi-dynamically configured flexible sub-frame in the radio frame, wherein

the first predetermined periodicity is larger than the second predetermined periodicity.

13. A data transmission apparatus, comprising:

a determining module configured to determine configuration information of at least one flexible sub-frame comprised in a Time Division Duplex (TDD) radio frame, wherein the flexible sub-frame is configured to comprise at least one uplink transmission symbol and at least one downlink transmission symbol, and sub-timeslots occupied by the uplink transmission symbol and the downlink transmission symbol are alternately configured;

a sending module configured to deliver the determined configuration information of the at least one flexible sub-frame to a user equipment (UE) by using signaling; and

a transmission module configured to, according to the determined configuration information of the at least one flexible sub-frame, receive uplink data in the time slot of the uplink transmission symbol and send downlink data in the time slot of the downlink transmission symbol.

14. The apparatus of claim 13, wherein the determining module comprises:

a first determining sub-module configured to determine configuration information of a Guard Period (GP) in the flexible sub-frame, wherein the GP is located between a downlink transmission symbol and an uplink transmission symbol when the downlink transmission symbol is transformed to the uplink transmission symbol.

15. The apparatus of claim 14, wherein the first determining sub-module is configured to determine that the GP is located between a downlink transmission symbol and an uplink transmission symbol in a same flexible sub-frame when the downlink transmission symbol is transformed to the uplink transmission symbol; or that the GP is located between a downlink transmission symbol and an uplink transmission symbol in adjacent flexible sub-frames when the downlink transmission symbol is transformed to the uplink transmission symbol.

16. The apparatus of claim 14, wherein the determining module further comprises: a second determining sub-module,

the second determining sub-module is configured to: for each flexible sub-frame, determine a location and a time length of a sub-timeslot that is occupied by each uplink transmission symbol and a location and a time length of a sub-timeslot that is occupied by each downlink transmission symbol, and

the first determining sub-module is configured to， when the flexible sub-frame is configured to further comprise a GP, determine a location and a time length of a sub-timeslot that is occupied by the GP.

17. The apparatus of claim 13 or 14, wherein the at least one flexible sub-frame comprises a dynamically configured flexible sub-frame, and the determining module is configured to periodically determine a location, occupation information, and a time length of each sub-timeslot in the dynamically configured flexible sub-frame.

18. The apparatus of claim 13 or 14, wherein the at least one flexible sub-frame comprises a semi-dynamically configured flexible sub-frame, the semi-dynamically configured flexible sub-frame comprises a fixedly configured timeslot and a flexibly configured timeslot, and the determining module is configured to:

at a first predetermined periodicity, determine a location, occupation information, and a time length of each fixedly configured timeslot in the semi-dynamically configured flexible sub-frame; and

at a second predetermined periodicity, determine a location, occupation information, and a time length of each flexibly configured timeslot in the semi-dynamically configured flexible sub-frame, wherein the first predetermined periodicity is larger than the second predetermined periodicity.

19. The apparatus of claim 13 or 14, wherein the signaling comprises broadcast signaling, Radio Resource Control (RRC) signaling, and physical layer signaling.

20. A data transmission apparatus, comprising:

a receiving module configured to receive, from a base station, configuration information of at least one flexible sub-frame comprised in a Time Division Duplex (TDD) radio frame, wherein the flexible sub-frame is configured to comprise at least one uplink transmission symbol and at least one downlink transmission symbol, and sub-timeslots occupied by the uplink transmission symbol and the downlink transmission symbol are alternately configured; and

a transmission module configured to, according to the configuration information of the at least one flexible sub-frame comprised in the TDD radio frame, send uplink data in the time slot of the uplink transmission symbol and receive downlink data in the time slot of the downlink transmission symbol.

21. The apparatus of claim 20, wherein the receiving module is configured to receive configuration information of a Guard Period (GP) in the flexible sub-frame, wherein the GP is located between a downlink transmission symbol and an uplink transmission symbol when

the downlink transmission symbol is transformed to the uplink transmission symbol.

22. The apparatus of claim 21, wherein the receiving module is further configured to receive the configuration information of the GP in the flexible sub-frame wherein the GP is located between a downlink transmission symbol and an uplink transmission symbol in a same flexible sub-frame when the downlink transmission symbol is transformed to the uplink transmission symbol; or the GP is located between a downlink transmission symbol and an uplink transmission symbol in adjacent flexible sub-frames when the downlink transmission symbol is transformed to the uplink transmission symbol.

23. The apparatus of claim 20 or 21, wherein the at least one flexible sub-frame comprises a dynamically configured flexible sub-frame, and the receiving module is configured to periodically receive, from the base station, structure information of the at least one dynamically configured flexible sub-frame in the TDD radio frame, wherein a location, occupation information, and a time length of each sub-timeslot in the dynamically configured flexible sub-frame are periodically and dynamically configured.

24. The apparatus of claim 20 or 21, wherein the at least one flexible sub-frame comprises a semi-dynamically configured flexible sub-frame, wherein the semi-dynamically configured flexible sub-frame comprises a fixedly configured timeslot and a flexibly configured timeslot, and the receiving module is configured to:

at a first predetermined periodicity, receive, from the base station, configuration information of a location, occupation information, and a time length of each fixedly configured timeslot in at least one semi-dynamically configured flexible sub-frame in the radio frame; and

at a second predetermined periodicity, receive, from the base station, configuration information of a location, occupation information, and a time length of each flexibly configured timeslot in at least one semi-dynamically configured flexible sub-frame in the radio frame, wherein the first predetermined periodicity is larger than the second

predetermined periodicity.

25. A data transmission apparatus, comprising:

a processor;

a memory configured to store instructions executable by the processor, wherein

the processor is configured to perform the method of any one of claims 1 to 7.

26. A storage medium having a computer program recorded thereon, wherein the program comprises instructions for performing the method of any one of claims 1 to 7.

27. A computer program, comprising instructions for performing the method of any one of claims 1 to 7 when the program is executed by a computer.

28. A data transmission apparatus, comprising:

a processor;

a memory configured to store instructions executable by the processor, wherein

the processor is configured to perform the method according to any one of claims 8 to 12.

29. A storage medium having a computer program recorded thereon, wherein the program comprises instructions for performing the method of any one of claims 8 to 12.

30. A computer program, comprising instructions for performing the method of any one of claims 8 to 12 when the program is executed by a computer.