sending a second RRC release message to the UE. The specific PDCCH resource is configured by the second RRC release message.

[0019] Optionally, sending the configured specific PDCCH resource to the UE includes: sending system information to the UE. The specific PDCCH resource is configured by the system information.

[0020] A third aspect of embodiments of the disclosure provides a data transmission apparatus, which includes: a determining module, configured to determine a current data transmission phase; and a processing module, configured to use one or more Configured Grant - Small Data Transmission (CG-SDT) resources in a CG SDT process according to the current data transmission phase.

[0021] A fourth aspect of embodiments of the disclosure provides a data transmission apparatus, which includes: a sending module, configured to send at least one configured Configured Grant - Small Data Transmission (CG-SDT) resource to a user equipment (UE). The UE uses the at least one CG-SDT resource in a CG SDT process according to a current data transmission phase.

[0022] A fifth aspect of embodiments of the disclosure provides a communication device, including: a transceiver, a memory, and a processor connected to the transceiver and the memory, respectively. The processor is configured to control transmitting and receiving of wireless signals of the transceiver by executing computer-executable instructions on the memory, and the processor is capable of realizing the data transmission method according to the first aspect of embodiments of the disclosure or the data transmission method according to the second aspect of embodiments of the disclosure.

[0023] A sixth aspect of embodiments of the disclosure provides a computer storage medium having executable instructions stored thereon. When the executable instructions are executed by a processor, the data transmission method according to the first aspect of embodiments of the disclosure is implemented, or the data transmission method according to the second aspect of embodiments of the disclosure is implemented.

[0024] A seventh aspect of embodiments of the disclosure provides a non-transitory computer-readable program product including computer programs. When the computer programs are executed by a processor, the data transmission method according to the first aspect of embodiments of the disclosure is implemented, or the data transmission method according to the second aspect of embodiments of

the disclosure is implemented.

[0025] With the data transmission method and apparatus and the communication device provided by embodiments of the disclosure, the UE determines the current data transmission phase, and uses the one or more CG SDT resources in the CG SDT process according to the current data transmission phase. Therefore, the UE can use an appropriate CG SDT resource for data transmission according to the current data transmission phase, which can improve the data transmission rate of the UE, thus enabling the UE to send more data during the SDT process.

[0026] Additional aspects and advantages of the disclosure will be given in part in the following descriptions, become apparent in part from the following descriptions, or be learned from the practice of the disclosure.

BRIEF DESCRIPTION OF THE DRAWINGS

[0027] Above and additional aspects and advantages of embodiments of the disclosure will become apparent and more readily appreciated from the following descriptions made with reference to the accompanying drawings, in which:

[0028] FIG. 1 is a schematic diagram of a SDT (Small Data Transmission) process according to an embodiment of the disclosure;

[0029] FIG. 2 is a schematic diagram of a CG-SDT (Configured Grant - Small Data Transmission) process according to an embodiment of the disclosure;

[0030] FIG. 3 is a flowchart of a data transmission method according to an embodiment of the disclosure;

[0031] FIG. 4 is a flowchart of a data transmission method according to an embodiment of the disclosure;

[0032] FIG. 5 is a flowchart of a data transmission method according to an embodiment of the disclosure;

[0033] FIG. 6 is a flowchart of a data transmission method according to an embodiment of the disclosure;

[0034] FIG. 7 is a flowchart of a data transmission method according to an embodiment of the disclosure;

[0035] FIG. 8 is a flowchart of a data transmission method according to an embodiment of the disclosure;

[0036] FIG. 9 is a flowchart of a data transmission method according to an embodiment of

CLAIMS

WHAT IS CLAIMED IS:

1. A data transmission method, performed by a user equipment (UE), comprising:

determining a current data transmission phase; and

using one or more Configured Grant - Small Data Transmission (CG-SDT) resources in a CG SDT process according to the current data transmission phase.

2. The method as claimed in claim 1, further comprising:

receiving at least one CG-SDT resource configured by a network device.

3. The method as claimed in claim 2, wherein the at least one CG-SDT resource is configured by a radio resource control (RRC) release message.

4. The method as claimed in any of claims 1 to 3, wherein the current data transmission phase is an initial data transmission phase, and using the one or more CG-SDT resources in the CG SDT process according to the current data transmission phase comprises:

~~determining that the current data transmission phase is an initial data transmission phase; and~~

after the UE sends data using a first CG-SDT resource, determining to no longer send data using another CG-SDT resource in response to no feedback information being received from a network device.

5. The method as claimed in claim 4, further comprising:

determining that a retransmission condition is satisfied, and using a retransmission CG-SDT resource to retransmit the data.

6. The method as claimed in any of claims 1 to 3, wherein the current data transmission phase is a subsequent data transmission phase, and using the one or more CG-SDT resources in the CG SDT process according to the current data transmission phase comprises:

~~determining that the current data transmission phase is a subsequent data transmission phase; and~~

using a plurality of CG-SDT resources for transmission.

7. The method as claimed in claim 6, wherein the plurality of CG-SDT resources correspond to the same beam, or the plurality of CG-SDT resources belong to the same CG-SDT resource group.

8. The method as claimed in claim 6, wherein the plurality of CG-SDT resources correspond the same beam as a CG-SDT resource used at an initial data transmission phase, or the plurality of CG-SDT resources belong to the same CG-SDT resource group as the CG-

SDT resource used at the initial data transmission phase.

9. The method as claimed in any of claims 1 to 8, further comprising:

monitoring control information of a network device using a specific physical downlink control channel (PDCCH) resource ~~configuration~~.

10. The method as claimed in any of claims 1 to 8, further comprising:

determining that the current data transmission phase is a subsequent data transmission phase; and

monitoring control information of a network device using a specific PDCCH resource ~~configuration~~.

11. The method as claimed in claim 9 or 10, wherein the specific PDCCH resource is configured by the network device.

12. The method as claimed in claim 9 or 10, wherein the specific PDCCH resource comprises at least one of:

a specific resource identifier;

a specific time domain resource configuration;

a specific frequency domain resource configuration;

a PDCCH resource the same as a PDCCH resource ~~corresponding to~~for receiving feedback information from the network device at an initial data transmission phase; or

a downlink signal associated with the specific PDCCH resource being the same as a downlink signal associated with a CG SDT resource used by the UE at the initial data transmission phase.

13. A data transmission method, performed by a network device, comprising:

sending at least one ~~configured~~ Configured Grant - Small Data Transmission (CG-SDT) resource to a user equipment (UE);

wherein the UE uses the at least one CG-SDT resource in a CG SDT process according to a current data transmission phase.

14. The method as claimed in claim 13, wherein sending the at least one ~~configured~~ CG-SDT resource to the UE comprises:

sending a first radio resource control (RRC) release message to the UE, wherein the at least one CG-SDT resource is configured by the first RRC release message.

15. The method as claimed in claim 13 or 14, further comprising:

sending a configured specific physical downlink control channel (PDCCH) resource to the UE, wherein the specific PDCCH resource is configured to monitor control information

of the network device.

16. The method as claimed in claim 15, wherein sending the configured specific PDCCH resource to the UE comprises:

sending a second RRC release message to the UE, wherein the specific PDCCH resource is configured by the second RRC release message.

17. The method as claimed in claim 15, wherein sending the configured specific PDCCH resource to the UE comprises:

sending system information to the UE, wherein the specific PDCCH resource is configured by the system information.

18. A data transmission apparatus, comprising:

a determining module, configured to determine a current data transmission phase; and

a processing module, configured to use one or more Configured Grant - Small Data Transmission (CG-SDT) resources in a CG SDT process according to the current data transmission phase.

~~19. A data transmission apparatus, comprising:~~

~~a sending module, configured to send at least one configured Configured Grant - Small Data Transmission (CG-SDT) resource to a user equipment (UE);~~

~~wherein the UE uses the at least one CG-SDT resource in a CG-SDT process according to a current data transmission phase.~~

~~20~~19. A user equipment~~communication device~~, comprising:

a transceiver~~,~~;

a memory~~,~~; and

a processor connected to the transceiver and the memory, respectively, wherein the processor is configured to ~~control transmitting and receiving of wireless signals of the transceiver by executing computer-executable instructions on the memory, and the processor is capable to~~ perform the data transmission method as claimed in any of claims 1 to 12, or perform the data transmission method as claimed in any of claims 13 to 17.

~~21~~20. A non-transitory computer-readable storage medium having computer-executable instructions stored thereon that, when executed by a processor, are capable to perform the data transmission method as claimed in any of claims 1 to 12, or perform the data transmission method as claimed in any of claims 13 to 17.