CLAIMS

1. A method for determining an application time of a beam, performed by a terminal device, comprising:

receiving downlink control information (DCI) based on a physical downlink control channel (PDCCH) of a first carrier, wherein the DCI is configured to indicate a beam corresponding to a designated resource on a second carrier;

sending indication information, wherein the indication information is configured to indicate a receiving state of the DCI; and

determining an application time of the beam corresponding to the designated resource according to a sending time point of the indication information;

wherein determining the application time of the beam corresponding to the designated resource according to the sending time point of the indication information comprises:

determining the application time of the beam corresponding to the designated resource according to the sending time point of the indication information and a designated time gap;

wherein the method further comprises:

determining the designated time gap according to at least one of: the first resource information, the second resource information, or third resource information of a PDCCH on the first carrier, wherein the DCI is further configured to indicate first resource information of at least one of a physical downlink shared channel (PDSCH) or a physical uplink shared channel (PUSCH) on the second carrier and second resource information of a physical uplink control channel (PUCCH) for sending the indication information;

wherein determining the designated time gap according to at least one of: the first resource information, the second resource information, or the third resource information of a PDCCH on the first carrier comprises:

determining the designated time gap according to a sub-carrier spacing (SCS) of the first resource information, wherein an SCS of the third resource information is greater than or equal to the SCS of the first resource information; or

determining the designated time gap according to an SCS of the second resource information, wherein the SCS of the third resource information is greater than or equal to the

SCS of the second resource information.

2. The method according to claim 1, wherein the designated resource comprises at least one of a channel or a reference signal resource.

3. The method according to claim 2, wherein the designated resource comprises at least one of:

a PDCCH, a PDSCH, a PUSCH, a PUCCH, a physical random access channel (PRACH), a physical broadcast channel (PBCH), a channel state information reference signal (CSI-RS), a sounding reference signal (SRS), a positioning reference signal (PRS), a tracking reference signal (TRS), or a synchronization signal block (SSB).

4. The method according to claim 3, further comprising:

determining the designated resource according to at least one of:

a control resource set identifier;

a control resource set pool identifier;

an identifier of a semi-persistent PDSCH;

an identifier of a resource corresponding to a PUCCH;

an identifier of a configured grant free PUSCH;

a PRACH resource identifier;

an SSB index;

a reference signal resource identifier; or,

a reference signal resource set identifier.

5. The method according to any one of claims 1 to 4, wherein determining the designated time gap according to at least one of: the first resource information, the second resource information, or the third resource information of a PDCCH on the first carrier comprises:

determining a first sub time in the designated time gap according to at least one of the SCS of the first resource information or the SCS of the second resource information, wherein the designated time gap is a sum of the first sub time and a second sub time.

6. The method according to claim 5, wherein determining the first sub time in the designated time gap according to at least one of the SCS of the first resource information or the SCS of the second resource information comprises at least one of:

determining the first sub time in the designated time gap according to the SCS of the first resource information, wherein the SCS of the third resource information is less than the SCS of the first resource information;

determining the first sub time in the designated time gap according to the SCS of the second resource information, wherein the SCS of the third resource information is less than the SCS of the first resource information;

determining the first sub time in the designated time gap according to the SCS of the first resource information, wherein the SCS of the third resource information is less than the SCS of the second resource information; or

determining the first sub time in the designated time gap according to the SCS of the second resource information, wherein the SCS of the third resource information is less than the SCS of the second resource information.

7. The method according to claim 5, further comprising:

determining the second sub time in the designated time gap.

8. The method according to claim 7, wherein determining the second sub time in the designated time gap comprises at least one of:

determining the second sub time in the designated time gap according to at least one of the SCS of the first resource information or the SCS of the third resource information; or

determining the second sub time in the designated time gap according to at least one of the SCS of the second resource information or the SCS of the third resource information.

9. The method according to claim 8, wherein,

the second sub time is directly proportional to the SCS of the first resource information and inversely proportional to the SCS of the third resource information; or

the second sub time is directly proportional to the SCS of the second resource information and inversely proportional to the SCS of the third resource information; or

the second sub time is directly proportional to the SCS of the first resource information and the SCS of the second resource information, and inversely proportional to the SCS of the third resource information.

10. The method according to any one of claims 1 to 9, wherein determining the designated time gap further comprises:

determining the designated time gap according to at least one of the second resource information or the third resource information of the PDCCH on the first carrier, wherein the DCI is further configured to indicate second resource information of a PUCCH for sending the indication information.

11. The method according to claim 10, wherein determining the designated time gap according to at least one of the second resource information or the third resource information of the PDCCH on the first carrier comprises:

determining the designated time gap according to at least one of the SCS of the second resource information or the SCS of the third resource information, wherein the SCS of the third resource information is greater than or equal to the SCS of the second resource information; or

determining a first sub time in the designated time gap according to at least one of the SCS of the second resource information or the SCS of the third resource information, wherein the SCS of the third resource information is less than the SCS of the second resource information, wherein the designated time gap is a sum of the first sub time and a second sub time.

12. The method according to claim 11, further comprising:

determining the second sub time in the designated time gap according to the SCS of the second resource information and the SCS of the third resource information.

13. The method according to claim 12, wherein,

the second sub time is directly proportional to the SCS of the second resource information and inversely proportional to the SCS of the third resource information.

14. The method according to any one of claims 1-13, wherein,

the first carrier and the second carrier correspond to different serving cells of the terminal device respectively;

the first carrier corresponds to a serving cell of the terminal device, and the second carrier corresponds to a non-serving cell of the terminal device; or

the first carrier corresponds to a non-serving cell of the terminal device, and the second carrier corresponds to a serving cell of the terminal device.

15. A communication device, configured on a terminal device side, comprising:

a transceiver module, configured to receive downlink control information (DCI) based on a physical downlink control channel (PDCCH) of a first carrier, wherein the DCI is configured to indicate a beam corresponding to a designated resource on a second carrier;

the transceiver module is configured to send indication information, wherein the indication information is configured to indicate a receiving state of the DCI; and

a processing module, configured to determine an application time of the beam corresponding to the designated resource according to a sending time point of the indication information;

wherein the processing module is configured to:

determine the application time of the beam corresponding to the designated resource according to the sending time point of the indication information and a designated time gap;

wherein the processing module is further configured to:

determine the designated time gap according to at least one of: the first resource information, the second resource information, or third resource information of a PDCCH on the first carrier, wherein the DCI is further configured to indicate first resource information of at least one of a physical downlink shared channel (PDSCH) or a physical uplink shared channel (PUSCH) on the second carrier and second resource information of a physical uplink

control channel (PUCCH) for sending the indication information;

wherein the processing module is further configured to:

determine the designated time gap according to a sub-carrier spacing (SCS) of the first resource information, wherein an SCS of the third resource information is greater than or equal to the SCS of the first resource information; or

determine the designated time gap according to an SCS of the second resource information, wherein the SCS of the third resource information is greater than or equal to the SCS of the second resource information.

16. A method for determining an application time of a beam, performed by a network device, comprising:

sending downlink control information (DCI) based on a physical downlink control channel (PDCCH) of a first carrier, wherein the DCI is configured to indicate a beam corresponding to a designated resource on a second carrier;

receiving indication information sent by a terminal device, wherein the indication information is configured to indicate a receiving state of the DCI at the terminal device; and

determining an application time of the beam corresponding to the designated resource according to a sending time point of the indication information at the terminal device;

wherein determining the application time of the beam corresponding to the designated resource according to the sending time point of the indication information comprises:

characterized in that, determining the application time of the beam corresponding to the designated resource according to the sending time point of the indication information and a designated time gap;

wherein the method further comprises:

determining the designated time gap according to at least one of: the first resource information, the second resource information, or third resource information of a PDCCH on the first carrier, wherein the DCI is further configured to indicate first resource information of at least one of a physical downlink shared channel (PDSCH) or a physical uplink shared channel (PUSCH) on the second carrier and second resource information of a physical uplink control channel (PUCCH) for sending the indication information,;

wherein determining the designated time gap according to at least one of: the first resource information, the second resource information, or the third resource information of a PDCCH on the first carrier comprises:

determining the designated time gap according to a sub-carrier spacing (SCS) of the first resource information, wherein an SCS of the third resource information is greater than or equal to the SCS of the first resource information; or

determining the designated time gap according to an SCS of the second resource information, wherein the SCS of the third resource information is greater than or equal to the SCS of the second resource information.

17. A communication device, configured on a network device, comprising:

a transceiver module, configured to send downlink control information (DCI) based on a physical downlink control channel (PDCCH) of a first carrier, wherein the DCI is configured to indicate a beam corresponding to a designated resource on a second carrier;

the transceiver module being configured to receive indication information sent by a terminal device, wherein the indication information is configured to indicate a receiving state of the DCI at the terminal device; and

a processing module, configured to determine an application time of the beam corresponding to the designated resource according to a sending time point of the indication information at the terminal device;

wherein the processing module is configured to:

characterized in that, determining the application time of the beam corresponding to the designated resource according to the sending time point of the indication information and a designated time gap;

wherein the processing module is further configured to:

determine the designated time gap according to at least one of: the first resource information, the second resource information, or third resource information of a PDCCH on the first carrier, wherein the DCI is further configured to indicate first resource information of at least one of a physical downlink shared channel (PDSCH) or a physical uplink shared channel (PUSCH) on the second carrier and second resource information of a physical uplink

control channel (PUCCH) for sending the indication information;

wherein the processing module is further configured to:

determine the designated time gap according to a sub-carrier spacing (SCS) of the first resource information, wherein an SCS of the third resource information is greater than or equal to the SCS of the first resource information; or

determine the designated time gap according to an SCS of the second resource information, wherein the SCS of the third resource information is greater than or equal to the SCS of the second resource information.

18. A computer-readable storage medium having instructions stored thereon, wherein when the instructions are executed, the method according to any one of claims 1 to 14, or the method according to claim 16 is implemented.