

CLAIMS

1. A mapping method, applied to a terminal device and comprising:

transmitting a random access message based on a target mapping relationship between physical uplink shared channel (PUSCH) resources and synchronization signal block (SSB)-related resources, wherein the target mapping relationship is determined according to a preset mapping rule, and

wherein the preset mapping rule comprises at least one of the following:

a first mapping rule, wherein the first mapping rule is used to determine a mapping relationship between PUSCH resource units of physical uplink shared channel occasion PUOs and SSBs, the first mapping rule comprises: the SSBs are mapped to the PUSCH resource units of PUOs according to a PUSCH resource unit numbering order and a PUO numbering order; and

a second mapping rule, wherein the second mapping rule is used to determine a mapping relationship between PUSCH resource units of PUOs and physical random access channel (PRACH) resource units corresponding to SSBs; wherein the second mapping rule comprises one of the following:

the PUSCH resource units of PUOs are mapped to the PRACH resource units corresponding to SSBs according to a PRACH resource unit numbering order and an SSB numbering order; or

the PRACH resource units corresponding to SSBs are mapped to the PUSCH resource units of PUOs according to a PUO numbering order and a PUSCH resource unit numbering order.

2. The method according to claim 1, wherein that the PUSCH resource units of PUOs are mapped to the PRACH resource units corresponding to SSBs according to the PRACH resource unit numbering order and the SSB numbering order comprises:

the PUSCH resource units of PUOs are mapped to PRACH resource units corresponding to I SSBs according to the PRACH resource unit numbering order, and mapped to N SSBs according to the SSB numbering order, wherein I and N are both positive integers and I is less than or equal to N.

3. The method according to claim 1, wherein that the PRACH resource units corresponding to SSBs are mapped to the PUSCH resource units of PUOs according to the PUO numbering order and the PUSCH resource unit numbering order comprises:

the PRACH resource units corresponding to SSBs are mapped to PUSCH resource units of J PUOs according to the PUSCH resource unit numbering order, and mapped to M PUOs according to the PUO numbering order, wherein J and M are both positive integers and J is less than or equal to M.

4. The method according to claim 1, wherein that the SSBs are mapped to the PUSCH resource units of PUOs according to the PUSCH resource unit numbering order and the PUO numbering order comprises:

the SSBs are mapped to PUSCH resource units of one PUO according to the PUSCH resource unit numbering order, and mapped to P PUOs according to the PUO numbering order, wherein P is a positive integer.

5. The method according to claim 1, wherein one PUCCH resource unit is associated with one SSB.

6. The method according to claim 1, wherein

the PUSCH resource units and the SSBs are mapped in an interlaced manner or non-interlaced manner;

or

the PUSCH resource units and the PRACH resource units corresponding to SSBs are mapped in an interlaced manner or non-interlaced manner.

7. The method according to claim 1, wherein before the transmitting a random access message based on a target mapping relationship between PUSCH resources and synchronization signal block SSB-related resources, the method further comprises:

in a case that first configuration information exists, establishing the mapping relationship between the PUSCH resource units of PUOs and the SSBs according to the first mapping rule, wherein the first configuration information is used to indicate that the PUSCH resource units are associated with the PRACH resource units corresponding to SSBs; or

in other cases, establishing the mapping relationship between the PUSCH resource units of PUOs and the PRACH resource units corresponding to SSBs according to the second mapping rule.

8. The method according to claim 1, wherein a mapping parameter of the target mapping relationship is determined by configuration information, and the configuration information comprises at least one of the following:

- an SSB parameter associated with one PUO, wherein the SSB parameter comprises a quantity of SSBs or a set of SSBs;

- a quantity of PUSCH resource units of one PUO;

- that Q PRACH resource units corresponding to one target SSB are associated with PUSCH resource units of PUO(s), wherein the target SSB is an SSB corresponding to the PUO(s), and Q is a positive integer;

- a PUSCH resource unit mapping spacing L, wherein L is greater than or equal to 1;

- an SSB mapping spacing V, wherein V is greater than or equal to 0;

- a PUO parameter associated with one SSB, wherein the PUO parameter comprises at least one of the following: time domain resources of a PUO, frequency domain resources of a PUO, a quantity of PUOs, and PUO index(es);

- a PRACH resource unit parameter associated with one PUSCH resource unit of one PUO, wherein the PRACH resource unit parameter comprises a quantity of PRACH resource units or a set of PRACH resource units;

- SSB grouping information, wherein the SSB grouping information comprises at least one of an SSB grouping manner, a quantity of SSB groups, and a quantity of SSBs in each SSB group; and

- a quantity of PUSCH resource units of one PUO that are associated with one SSB.

9. The method according to claim 8, wherein

in a case that $L = 1$, the PUSCH resource units and the SSBs are mapped in a non-interlaced manner, or the PUSCH resource units and the PRACH resource units corresponding to SSBs are mapped in a non-interlaced manner; or

in a case that $L > 1$, the PUSCH resource units and the SSBs are mapped in an interlaced manner, or the PUSCH resource units and the PRACH resource units corresponding to SSBs are mapped in an interlaced manner.

10. The method according to claim 1, wherein the PUSCH resource unit comprises at least one of the following:

- a time domain resource of a PUSCH;
- a frequency domain resource of a PUSCH;
- a demodulation reference signal (DMRS) port;
- a DMRS sequence;
- a DMRS scrambling identifier; and
- a PUSCH scrambling identifier.

11. A mapping method, applied to a network-side device and comprising:

receiving a random access message based on a target mapping relationship between physical uplink shared channel (PUSCH) resources and synchronization signal block (SSB)-related resources, wherein

the target mapping relationship is determined according to a preset mapping rule, and wherein the preset mapping rule comprises at least one of the following:

a first mapping rule, wherein the first mapping rule is used to determine a mapping relationship between PUSCH resource units of physical uplink shared channel occasions PUOs and SSBs, the first mapping rule comprises: the SSBs are mapped to the PUSCH resource units of PUOs according to a PUSCH resource unit numbering order and a PUO numbering order; and

a second mapping rule, wherein the second mapping rule is used to determine a mapping relationship between PUSCH resource units of PUOs and (PRACH) resource units corresponding to SSBs; wherein the second mapping rule comprises one of the following:

the PUSCH resource units of PUOs are mapped to the PRACH resource units corresponding to SSBs according to a PRACH resource unit numbering order and an SSB numbering order; and

the PRACH resource units corresponding to SSBs are mapped to the PUSCH resource units of PUOs according to a PUO numbering order and a PUSCH resource unit numbering order.

12. The method according to claim 11, wherein that the PUSCH resource units of PUOs are mapped to the PRACH resource units corresponding to SSBs according to the PRACH resource unit numbering order and the SSB numbering order comprises:

the PUSCH resource units of PUOs are mapped to PRACH resource units corresponding to I SSBs according to the PRACH resource unit numbering order, and mapped to N SSBs according to the SSB numbering order, wherein I and N are both positive integers and I is less than or equal to N.

13. The method according to claim 11, wherein that the PRACH resource units corresponding to SSBs are mapped to the PUSCH resource units of PUOs according to the PUO numbering order and the PUSCH resource unit numbering order comprises:

the PRACH resource units corresponding to SSBs are mapped to PUSCH resource units of J PUOs according to the PUSCH resource unit numbering order, and mapped to M PUOs according to the PUO numbering order, wherein J and M are both positive integers and J is less than or equal to M.

14. The method according to claim 11, wherein that the SSBs are mapped to the PUSCH resource units of PUOs according to the PUSCH resource unit numbering order and the PUO numbering order comprises:

the SSBs are mapped to PUSCH resource units of one PUO according to the PUSCH resource unit numbering order, and mapped to P PUOs according to the PUO numbering order, wherein P is a positive integer.

15. A terminal device, comprising:

a transmitting module, configured to transmit a random access message based on a target mapping relationship between physical uplink shared channel (PUSCH) resources and synchronization signal block (SSB)-related resources, wherein

the target mapping relationship is determined according to a preset mapping rule, and

wherein the preset mapping rule comprises at least one of the following:

a first mapping rule, wherein the first mapping rule is used to determine a mapping relationship between PUSCH resource units of physical uplink shared channel occasions PUOs and SSBs, the first mapping rule comprises: the SSBs are mapped to the PUSCH resource units of PUOs according to a PUSCH resource unit numbering order and a PUO numbering order; and

a second mapping rule, wherein the second mapping rule is used to determine a mapping relationship between PUSCH resource units of PUOs and physical random access channel (PRACH) resource units corresponding to SSBs; wherein the second mapping rule comprises one of the following:

the PUSCH resource units of PUOs are mapped to the PRACH resource units corresponding to SSBs according to a PRACH resource unit numbering order and an SSB numbering order; or

the PRACH resource units corresponding to SSBs are mapped to the PUSCH resource units of PUOs according to a PUO numbering order and a PUSCH resource unit numbering order.

16. A network-side device, comprising:

a receiving module, configured to receive a random access message based on a target mapping relationship between physical uplink shared channel (PUSCH) resources and synchronization signal block (SSB)-related resources, wherein

the target mapping relationship is determined according to a preset mapping rule, and wherein the preset mapping rule comprises at least one of the following:

a first mapping rule, wherein the first mapping rule is used to determine a mapping relationship between PUSCH resource units of physical uplink shared channel occasions PUOs and SSBs, the first mapping rule comprises: the SSBs are mapped to the PUSCH resource units of PUOs according to a PUSCH resource unit numbering order and a PUO numbering order; and

a second mapping rule, wherein the second mapping rule is used to determine a mapping relationship between PUSCH resource units of PUOs and physical random access channel (PRACH) resource units corresponding to SSBs; wherein the second mapping rule comprises one of the following:

the PUSCH resource units of PUOs are mapped to the PRACH resource units corresponding to SSBs according to a PRACH resource unit numbering order and an SSB numbering order; or

the PRACH resource units corresponding to SSBs are mapped to the PUSCH resource units of PUOs according to a PUO numbering order and a PUSCH resource unit numbering order.