CLAIMS

What is claimed is:

1. A method for reference signal generation, applied to a first communications device and comprising:

in a case that indication information is received from a second communications device, performing first modulation and then discrete Fourier transform modulation on at least one of target-reference-signal sequences to generate a target reference signal; wherein

the first modulation comprises any one of the following: π/2-binary phase shift keying BPSK modulation and 8-phase shift keying PSK modulation, and the indication information is used to indicate that the first communications device uses the target reference signal for transmission;

characterized in that,

in a case that the number of subcarriers occupied by the target reference signal is 6, the target-reference-signal sequences comprise at least one of the following sequences:

5, −7, 7, 1, 5, 1;

−3, 7, −5, −1, −5, −1;

5, 7, −3, −5, 5, −5.

2. The method according to claim 1, wherein

in a case that the number of subcarriers occupied by the target reference signal is 6, the target-reference-signal sequences further comprise at least one of the following sequences:

7, 3, –1, –5, –1, 3;

7, –5, 7, –5, 7, 3;

5, –7, 5, –7, –3, –7;

3, 1, 5, 1, 5, –7;

1, 5, –7, 7, 1, 5;

7, –5, 3, 5, –1, –7;

3, –1, 3, –3, –5, –1;

~~5, 7, 7, 1, 5, 1;~~

~~3, 7, 5, 1, 5, 1;~~

5, –1, –3, –1, 5, –5;

7, –7, 1, 5, 3, –3;

7, 1, 7, –3, –1, –3;

7, 1, –5, –7, –5, 1;

–5, 5, –1, –3, –1, 5; and

–5, –1, –7, 7, –5, –1.

3. The method according to claim 2, wherein the target-reference-signal sequences further comprises at least one of the following sequences:

~~5, 7, –3, –5, 5, –5;~~

–1, 1, 5, –5, 7, 3;

3, 5, –1, 5, –1, –3;

7, –7, 5, 1, –3, 3;

7, –1, –3, 5, –7, 5;

7, 5, –7, 1, –3, 7;

–1, –3, 3, 5, –1, 5;

7, –1, 3, 1, 1, –5;

–3, –5, –5, 5, 1, –7;

5, –7, 7, 1, 5, 1;

3, –7, –3, –1, –5, 7;

7, 1, –5, –7, –5, 1;

–7, 5, 7, –5, 1, –3;

–5, 5, –1, –3, –1, 5; and

–5, –1, –7, 7, –5, –1.

4. The method according to claim 1, wherein in resource mapping for the target reference signal, for any demodulation reference signal DMRS port, a time domain orthogonal cover code TD-OCC is [+1, +1].

5. The method according to claim 1, wherein in resource mapping for the target reference signal, for any DMRS port, a frequency domain orthogonal cover code FD-OCC is [+1, +1].

6. The method according to claim 1, wherein the performing first modulation and then discrete Fourier transform modulation on at least one of target-reference-signal sequences to generate a target reference signal comprises:

in a case that a physical channel demodulation reference signal or a channel state information acquisition reference signal is transmitted based on transmission precoding, performing first modulation and then discrete Fourier transform modulation on the at least one of the target-reference-signal sequences to generate the target reference signal.

7. The method according to claim 6, wherein the physical channel demodulation reference signal comprises one or more of the following: physical uplink shared channel demodulation reference signal PUSCH DMRS, physical downlink shared channel demodulation reference signal PDSCH DMRS, physical sidelink shared channel demodulation reference signal PSSCH DMRS, physical uplink control channel demodulation reference signal PUCCH DMRS, physical downlink control channel demodulation reference signal PDCCH DMRS, physical sidelink control channel demodulation reference signal PSCCH DMRS, and physical broadcast channel demodulation reference signal PBCH DMRS.

8. The method according to claim 6, wherein the channel state information acquisition reference signal comprises one or more of the following: sounding reference signal SRS and channel state information reference signal CSI-RS.

9. The method according to claim 1, further comprising:

generating the target-reference-signal sequences according to a predetermined rule; wherein

the predetermined rule comprises one or more of the following:

an average value of shift auto-correlation between reference signal modulation symbols of the target reference signal is the smallest;

a peak-to-average power ratio PAPR value of corresponding time-domain symbols resulting from inverse Fourier transform on reference signal modulation symbols of the target reference signal is the smallest;

an average value of cross-correlation between reference signal modulation symbols of the target reference signal is the smallest; and

demodulation performance of the target-reference-signal sequences meets a specified requirement.

10. A first communications device, comprising: a processor, a memory, and a program stored in the memory and capable of running on the processor, wherein when the program is

executed by the processor, the following steps of the method for reference signal generation are implemented:

in a case that indication information is received from a second communications device, perform first modulation and then discrete Fourier transform modulation on at least one of target-reference-signal sequences to generate a target reference signal, wherein the first modulation comprises any one of the following: π/2-BPSK modulation and 8-PSK modulation, and the indication information is used to indicate that the first communications device uses the target reference signal for transmission;

characterized in that,

in a case that the number of subcarriers occupied by the target reference signal is 6, the target-reference-signal sequences comprise at least one of the following sequences:

5, −7, 7, 1, 5, 1;

−3, 7, −5, −1, −5, −1;

5, 7, −3, −5, 5, −5.

11. The first communications device according to claim 10, wherein

in a case that the number of subcarriers occupied by the target reference signal is 6, the target-reference-signal sequences further comprises at least one of the following sequences:

7, 3, –1, –5, –1, 3;

7, –5, 7, –5, 7, 3;

5, –7, 5, –7, –3, –7;

3, 1, 5, 1, 5, –7;

1, 5, –7, 7, 1, 5;

7, –5, 3, 5, –1, –7;

3, –1, 3, –3, –5, –1;

~~5, 7, 7, 1, 5, 1;~~

~~3, 7, 5, 1, 5, 1;~~

5, –1, –3, –1, 5, –5;

7, –7, 1, 5, 3, –3;

7, 1, 7, –3, –1, –3;

7, 1, –5, –7, –5, 1;

–5, 5, –1, –3, –1, 5; and

–5, –1, –7, 7, –5, –1.

12. The first communications device according to claim 11, wherein the target-reference-signal sequences further comprises at least one of the following sequences:

~~5, 7, –3, –5, 5, –5;~~

–1, 1, 5, –5, 7, 3;

3, 5, –1, 5, –1, –3;

7, –7, 5, 1, –3, 3;

7, –1, –3, 5, –7, 5;

7, 5, –7, 1, –3, 7;

–1, –3, 3, 5, –1, 5;

7, –1, 3, 1, 1, –5;

–3, –5, –5, 5, 1, –7;

5, –7, 7, 1, 5, 1;

3, –7, –3, –1, –5, 7;

7, 1, –5, –7, –5, 1;

–7, 5, 7, –5, 1, –3;

–5, 5, –1, –3, –1, 5; and

–5, –1, –7, 7, –5, –1.

13. The first communications device according to claim 10, wherein in resource mapping for the target reference signal, for any demodulation reference signal DMRS port, a time domain orthogonal cover code TD-OCC is [+1, +1].

14. The first communications device according to claim 10, wherein in resource mapping for the target reference signal, for any DMRS port, a frequency domain orthogonal cover code FD-OCC is [+1, +1].

15. The first communications device according to claim 10, wherein when the program is executed by the processor, the following steps are implemented:

in a case that a physical channel demodulation reference signal or a channel state information acquisition reference signal is transmitted based on transmission precoding,

performing first modulation and then discrete Fourier transform modulation on the at least one of the target-reference-signal sequences to generate the target reference signal.

16. The first communications device according to claim 15, wherein the physical channel demodulation reference signal comprises one or more of the following: physical uplink shared channel demodulation reference signal PUSCH DMRS, physical downlink shared channel demodulation reference signal PDSCH DMRS, physical sidelink shared channel demodulation reference signal PSSCH DMRS, physical uplink control channel demodulation reference signal PUCCH DMRS, physical downlink control channel demodulation reference signal PDCCH DMRS, physical sidelink control channel demodulation reference signal PSCCH DMRS, and physical broadcast channel demodulation reference signal PBCH DMRS.

17. The first communications device according to claim 15, wherein the channel state information acquisition reference signal comprises one or more of the following: sounding reference signal SRS and channel state information reference signal CSI-RS.

18. The first communications device according to claim 10, wherein when the program is executed by the processor, the following steps are implemented:

generating the target-reference-signal sequences according to a predetermined rule; wherein

the predetermined rule comprises one or more of the following:

an average value of shift auto-correlation between reference signal modulation symbols of the target reference signal is the smallest;

a peak-to-average power ratio PAPR value of corresponding time-domain symbols resulting from inverse Fourier transform on reference signal modulation symbols of the target reference signal is the smallest;

an average value of cross-correlation between reference signal modulation symbols of the target reference signal is the smallest; and

demodulation performance of the target-reference-signal sequences meets a specified requirement.

19. A communications device, comprising a processor, a memory, and a program stored in the memory and capable of running on the processor, wherein when the program is executed by

the processor, the steps of the method for reference signal generation according to any one of claims 1 to 9 are implemented.

20. A computer-readable storage medium, wherein the computer-readable storage medium stores a computer program, and when the computer program is executed by a processor, the steps of the method for reference signal generation according to any one of claims 1 to 9 are implemented.