CLAIMS

What is claimed is:

1. A signal processing method, wherein the method comprises:

generating a physical layer protocol data unit (PPDU), wherein the PPDU comprises a first field, the first field is used for carrying M sequences, the M sequences correspond to M space-time streams, one sequence corresponds to one space-time stream, M is a positive integer, the M sequences comprise a first sequence, cross-correlation energy between the first sequence and at least two of the M sequences within a length range of a Golay complementary sequence is zero when M is greater than 2, autocorrelation side lobe energy of the first sequence within the length range of the Golay complementary sequence is zero, the first sequence is obtained based on a channel estimation CE sequence, and the Golay complementary sequence is used for constructing the CE sequence; and

sending the PPDU,

wherein the M sequences are used for target sensing.

2. A signal processing method, wherein the method comprises:

receiving a physical layer protocol data unit (PPDU), wherein the PPDU comprises a first field, the first field is used for carrying M sequences, the M sequences correspond to M space-time streams, one sequence corresponds to one space-time stream, M is a positive integer, the M sequences comprise a first sequence, cross-correlation energy between the first sequence and at least two of the M sequences within a length range of a Golay complementary sequence is zero when M is greater than 2, autocorrelation side lobe energy of the first sequence within the length range of the Golay complementary sequence is zero, the first sequence is obtained based on a channel estimation CE sequence, and the Golay complementary sequence is used for constructing the CE sequence; and

performing signal processing based on the M sequences,

wherein the M sequences are used for target sensing.

3. The method according to claim 1 or 2, wherein when M is greater than 4, cross-correlation energy between the first sequence and at least three of the M sequences within the length range of the Golay complementary sequence is zero.

4. The method according to claim 3, wherein the first sequence is obtained based on a P-matrix and the CE sequence, and the P-matrix is:

$$P=\begin{bmatrix} +1 & +1 \\ +1 & +1 \\ +1 & +1 \\ +1 & +1 \\ +1 & -1 \\ +1 & -1 \\ +1 & -1 \\ +1 & -1 \end{bmatrix}.$$

5. The method according to any one of claims 1 to 4, wherein the Golay complementary sequence comprises first Golay complementary sequences Ga and Gb, the first sequence is obtained based on Ga, Gb, and a first symbol sequence, and the first symbol sequence is used for representing positive and negative symbols of Ga and Gb.

6. The method according to claim 5, wherein the first symbol sequence $a(n) = \{a_1, a_2, a_3, a_4, a_5, a_6, a_7, a_8, a_9, a_{10}\}$, a_1 is equal to a_9, a_2 is equal to a_{10}, and a value of each element in $a(n)$ is 1 or –1.

7. The method according to claim 6, wherein $a(n)$ meets at least one of the following:

$$a_1 \cdot a_2 + a_3 \cdot a_4 + a_5 \cdot a_6 + a_7 \cdot a_8 = 0$$
$$a_2 \cdot a_3 + a_4 \cdot a_5 + a_6 \cdot a_7 + a_8 \cdot a_9 = 0$$
$$a_3 \cdot a_4 + a_5 \cdot a_6 + a_7 \cdot a_8 + a_9 \cdot a_{10} = 0$$

8. The method according to claim 5 or 6, wherein values of a_1 to a_{10} are any one of the following, and a horizontal order sequentially corresponds to a_1 to a_{10}:

1	1	–1	1	–1	1	1	1	1	1;
1	1	–1	1	1	–1	1	1	1	1;
1	1	–1	1	1	1	–1	1	1	1;
1	1	1	–1	1	1	–1	1	1	1;
1	1	1	1	–1	1	–1	1	1	1;
1	1	–1	–1	–1	1	–1	1	1	1;
1	1	–1	–1	1	–1	–1	1	1	1;
1	1	–1	1	–1	–1	–1	1	1	1;
1	1	–1	1	1	1	1	–1	1	1;
1	1	1	–1	1	1	1	–1	1	1;
1	1	1	1	–1	1	1	–1	1	1;
1	1	–1	–1	–1	1	1	–1	1	1;

1	1	1	1	1	–1	1	–1	1	1;
1	1	1	–1	–1	–1	1	–1	1	1;
1	1	1	–1	–1	1	–1	–1	1	1;
1	1	–1	1	1	–1	–1	–1	1	1;
1	1	1	–1	1	–1	–1	–1	1	1;
–1	1	–1	1	1	1	1	1	–1	1;
–1	1	1	–1	1	1	1	1	–1	1;
–1	1	1	1	–1	1	1	1	–1	1;
–1	1	–1	–1	–1	1	1	1	–1	1;
–1	1	1	1	1	–1	1	1	–1	1;
–1	1	1	–1	–1	–1	1	1	–1	1;
–1	1	1	1	1	1	–1	1	–1	1;
–1	1	1	1	–1	–1	–1	1	–1	1;
–1	1	–1	–1	–1	–1	–1	1	–1	1;
–1	1	–1	–1	1	1	1	–1	–1	1;
–1	1	1	1	–1	–1	1	–1	–1	1;
–1	1	–1	–1	–1	–1	1	–1	–1	1;
–1	1	–1	1	1	1	–1	–1	–1	1;
–1	1	1	–1	1	1	–1	–1	–1	1;
–1	1	1	1	–1	1	–1	–1	–1	1;
–1	1	–1	–1	–1	1	–1	–1	–1	1;
–1	1	–1	–1	1	–1	–1	–1	–1	1;
–1	1	–1	1	–1	–1	–1	–1	–1	1.

9. The method according to any one of claims 1 to 6, wherein when M is greater than 2, the M sequences further comprise a second sequence, cross-correlation energy between the second sequence and the first sequence within the length range of the Golay complementary sequence is zero, and the Golay complementary sequence further comprises second Golay complementary sequences Ga' and Gb'; and

the second sequence is obtained based on Ga', Gb', and a second symbol sequence $b(n) = \{b_1, b_2, b_3, b_4, b_5, b_6, b_7, b_8, b_9, b_{10}\}$, the second symbol sequence is used for representing positive and negative symbols of Ga' and Gb', b_1 is equal to b_9, b_2 is equal to b_{10}, a value of each

element in $b(n)$ is 1 or –1, and $b(n)$ is not equal to $a(n)$.

10. The method according to claim 9, wherein $a(n)$ and $b(n)$ meet at least one of the following:

$$a_4 \cdot b_3 + a_6 \cdot b_5 + a_8 \cdot b_7 + a_{10} \cdot b_9 = 0$$
$$a_2 \cdot b_2 + a_4 \cdot b_4 + a_6 \cdot b_6 + a_8 \cdot b_8 = 0$$
$$a_3 \cdot b_3 + a_5 \cdot b_5 + a_7 \cdot b_7 + a_9 \cdot b_9 = 0$$
$$a_3 \cdot b_2 + a_5 \cdot b_4 + a_7 \cdot b_6 + a_9 \cdot b_8 = 0$$
$$a_2 \cdot b_3 + a_4 \cdot b_5 + a_6 \cdot b_7 + a_8 \cdot b_9 = 0$$
$$a_1 \cdot b_2 + a_3 \cdot b_4 + a_5 \cdot b_6 + a_7 \cdot b_8 = 0$$

11. The method according to claim 9 or 10, wherein

when $a(n) = \{1,1,-1,1,-1,1,1,1,1,1\}$, $b(n) = \{1,1,1,-1,-1,1,-1,-1,1,1\}$, or $b(n) = \{-1,1,-1,-1,1,1,1,-1,-1,1\}$;

when $a(n) = \{1,1,1,-1,1,-1,1,1,1,1\}$, $b(n) = \{1,1,-1,1,1,-1,-1,-1,1,1\}$, or $b(n) = \{-1,1,1,1,-1,-1,1,-1,-1,1\}$;

when $a(n) = \{1,1,1,1,-1,1,-1,1,1,1\}$, $b(n) = \{1,1,-1,-1,-1,1,1,-1,1,1\}$, or $b(n) = \{-1,1,1,-1,1,1,-1,-1,-1,1\}$;

when $a(n) = \{1,1,-1,-1,1-,1,-1,1,1,1\}$, $b(n) = \{1,1,1,1,1,-1,1,-1,1,1\}$, or $b(n) = \{-1,1,-1,1,-1,-1,-1,-1,-1,1\}$;

when $a(n) = \{1,1,-1,-1,-1,1,1,-1,1,1\}$, $b(n) = \{-1,1,-1,1,1,1,1,1,-1,1\}$;

when $a(n) = \{1,1,1,1,1,-1,1,-1,1,1\}$, $b(n) = \{-1,1,1,-1,-1,-1,1,1,-1,1\}$;

when $a(n) = \{1,1,1,-1,-1,1,-1,-1,1,1\}$, $b(n) = \{-1,1,1,1,1,1,-1,1,-1,1\}$;

when $a(n) = \{1,1,-1,1,1,-1,-1,-1,1,1\}$, $b(n) = \{-1,1,-1,-1,-1,-1,-1,1,-1,1\}$;

when $a(n) = \{-1,1,-1,1,1,1,1,1,-1,1\}$, $b(n) = \{-1,1,1,-1,1,1,-1,-1,-1,1\}$;

when $a(n) = \{-1,1,1,-1,-1,-1,1,1,-1,1\}$, $b(n) = \{-1,1,-1,1,-1,-1,-1,-1,-1,1\}$;

when $a(n) = \{-1,1,1,1,1,1,-1,1,-1,1\}$, $b(n) = \{-1,1,-1,-1,1,1,1,-1,-1,1\}$; or

when $a(n) = \{-1,1,-1,-1,-1,-1,-1,1,-1,1\}$, $b(n) = \{-1,1,1,1,-1,-1,1,-1,-1,1\}$.

12. The method according to any one of claims 1 to 11, wherein the first field is a training field unit in the PPDU;

the first field is an enhanced directional multi-gigabit channel estimation field in the PPDU; or

the first field is a long training field in the PPDU.

13. A communication apparatus, comprising a processor and a memory, wherein

the processor is configured to store computer-executable instructions; and

the processor is configured to execute the computer-executable instructions, to perform the method according to any one of claims 1 to 12.

14. A communication apparatus, comprising a logic circuit and an interface, wherein the logic circuit is coupled to the interface; and

the interface is configured to input and/or output code instructions, and the logic circuit is configured to execute the code instructions, to perform the method according to any one of claims 1 to 12.

15. A computer-readable storage medium, wherein the computer-readable storage medium is configured to store a computer program, and when the computer program is executed, the method according to any one of claims 1 to 12 is performed.

16. A computer program, wherein when the computer program is executed, the method according to any one of claims 1 to 12 is performed.