CLAIMS

1. An ultra-wideband-based physical layer protocol data unit PPDU transmission method, comprising:

generating, by a communication apparatus, a physical layer protocol data unit PPDU, wherein the PPDU comprises a first sequence, a periodic autocorrelation main lobe amplitude of the first sequence is not zero and a periodic autocorrelation side lobe amplitude of the first sequence is zero, a periodic cross-correlation function of the first sequence and a second sequence has a maximum of three different values, and the first sequence and the second sequence belong to a same sequence pair; and

sending, by the communication apparatus, the PPDU.

2. An ultra-wideband-based physical layer protocol data unit PPDU transmission method, comprising:

receiving, by a communication apparatus, a physical layer protocol data unit PPDU, wherein the PPDU comprises a first sequence, a periodic autocorrelation main lobe amplitude of the first sequence is not zero and a periodic autocorrelation side lobe amplitude of the first sequence is zero, a periodic cross-correlation function of the first sequence and a second sequence has a maximum of three different values, and the first sequence and the second sequence belong to a same sequence pair; and

processing, by the communication apparatus, the PPDU.

3. The method according to claim 1 or 2, wherein lengths of the first sequence and the second sequence are both N, and the periodic cross-correlation function of the first sequence and the second sequence comprises one or more of the following values:

0; $2^{(n-f)/2}$; and $-2^{(n-f)/2}$, wherein

$f=2\times e-\gcd(n, 3k)$, $e=\gcd(n, k)$, a quotient of dividing n by e is an odd number, $\gcd(n, k)$ represents a greatest common divisor of n and k, $\gcd(n, 3k)$ represents a greatest common divisor of n and 3k, k is a positive integer, and n satisfies $2^n=N+1$.

4. The method according to any one of claims 1 to 3, wherein the length of the first sequence is 511 bits, and the first sequence is any sequence in Table 1; or

the length of the first sequence is 127 bits, and the first sequence is any sequence in Table 2.

5. The method according to any one of claims 1 to 4, wherein the first sequence is generated based on a d_1-times decimated sequence of an m-sequence, and the second sequence is generated based on a d_2-times decimated sequence of the m-sequence, wherein $d_1=(2^k+1)^{-1}$ and $d_2=2^{2k}-2^k+1$, and d_1 satisfies $d_1\times d_{1-1}=d_1\times(2^k+1)=1(\text{mod } N)$; or $d_1=(2^k+1)$ and $d_2=(2^{2k}-2^k+1)^{-1}$, and d_2 satisfies $d_2\times d_{2-1}=d_2\times(2^{2k}-2^k+1)=1(\text{mod } N)$, wherein k is a positive integer, and N is a length of the m-

sequence.

6. The method according to any one of claims 1 to 5, wherein the first sequence is carried in one or more of the following fields of the PPDU: a synchronization field, a wake-up field, a sensing field, or a ranging field.

7. The method according to any one of claims 1 to 6, wherein a periodic autocorrelation main lobe amplitude of the second sequence is not zero and a periodic autocorrelation side lobe amplitude of the second sequence is zero.

8. The method according to claim 1, wherein the method further comprises:

receiving, by the communication apparatus, sequence configuration information, wherein the sequence configuration information comprises sequence index information, and the sequence index information corresponds to the first sequence.

9. The method according to claim 2, wherein the method further comprises:

sending or receiving, by the communication apparatus, sequence configuration information, wherein the sequence configuration information comprises sequence index information, and the sequence index information corresponds to the first sequence.

10. A communication apparatus, comprising:

a processing unit, configured to generate a physical layer protocol data unit PPDU, wherein the PPDU comprises a first sequence, a periodic autocorrelation main lobe amplitude of the first sequence is not zero and a periodic autocorrelation side lobe amplitude of the first sequence is zero, a periodic cross-correlation function of the first sequence and a second sequence has a maximum of three different values, and the first sequence and the second sequence belong to a same sequence pair; and

a transceiver unit, configured to send the PPDU.

11. The apparatus according to claim 10, wherein the transceiver unit is further configured to:

receive sequence configuration information, wherein the sequence configuration information comprises sequence index information, and the sequence index information corresponds to the first sequence.

12. A communication apparatus, comprising:

a transceiver unit, configured to receive a physical layer protocol data unit PPDU, wherein the PPDU comprises a first sequence, a periodic autocorrelation main lobe amplitude of the first sequence is not zero and a periodic autocorrelation side lobe amplitude of the first sequence is zero, a periodic cross-correlation function of the first sequence and a second sequence has a maximum of three different values, and the first sequence and the second sequence belong to a same sequence pair; and

a processing unit, configured to process the PPDU.

13. The apparatus according to claim 12, wherein the transceiver unit is further configured to:

send or receive sequence configuration information, wherein the sequence configuration information comprises sequence index information, and the sequence index information corresponds to the first sequence.

14. The apparatus according to any one of claims 10 to 13, wherein lengths of the first sequence and the second sequence are both N, and the periodic cross-correlation function of the first sequence and the second sequence comprises one or more of the following values:

0; $2^{(n-f)/2}$; and $-2^{(n-f)/2}$, wherein

$f=2\times e-\gcd(n, 3k)$, $e=\gcd(n, k)$, a quotient of dividing n by e is an odd number, $\gcd(n, k)$ represents a greatest common divisor of n and k, $\gcd(n, 3k)$ represents a greatest common divisor of n and 3k, k is a positive integer, and n satisfies $2^n=N+1$.

15. The apparatus according to any one of claims 10 to 14, wherein the length of the first sequence is 511 bits, and the first sequence is any sequence in Table 1; or

the length of the first sequence is 127 bits, and the first sequence is any sequence in Table 2.

16. The apparatus according to any one of claims 10 to 15, wherein the first sequence is generated based on a d_1-times decimated sequence of an m-sequence, and the second sequence is generated based on a d_2-times decimated sequence of the m-sequence, wherein $d_1=(2^k+1)^{-1}$ and $d_2=2^{2k}-2^k+1$, and d_1 satisfies $d_1\times d_1^{-1}=d_1\times(2^k+1)=1 \pmod N$; or $d_1=(2^k+1)$ and $d_2=(2^{2k}-2^k+1)^{-1}$, and d_2 satisfies $d_2\times d_2^{-1}=d_2\times(2^{2k}-2^k+1)=1 \pmod N$, wherein k is a positive integer, and N is a length of the m-sequence.

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

the memory is configured to store instructions; and

the processor is configured to execute the instructions, to perform the method according to any one of claims 1 to 9.

18. 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, so that the method according to any one of claims 1 to 9 is performed.

19. A wireless communication system, comprising the communication apparatus according to claim 10 or 11, and the communication apparatus according to claim 12 or 13.

20. 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 9 is performed.