CLAIMS

What is claimed is:

1. A channel information feedback method, comprising:

generating (S430) first indication information, wherein the first indication information is determined based on a received precoded reference signal, and the precoded reference signal corresponds to P reference signal ports; the first indication information indicates B complex coefficients, the B complex coefficients are determined from K complex coefficients according to a preset priority value, the K complex coefficients are determined from a complex coefficient set, the complex coefficient set comprises U complex coefficients that are determined for an s^{th} reference signal port in S reference signal ports at each transport layer of Z transport layers, wherein s = 0, 1, ..., S−1, the S reference signal ports are a part or all of the P reference signal ports, the U complex coefficients are a part or all of T_s complex coefficients corresponding to the s^{th} reference signal port, and the preset priority value is related to at least one of the following: an index value of each complex coefficient in the K complex coefficients, an index value of a reference signal port corresponding to each complex coefficient in the K complex coefficients in the S reference signal ports, and an index value of each complex coefficient in the K complex coefficients in a plurality of complex coefficients that are allowed to be selected for a corresponding reference signal port; wherein P, B, K, S, Z, and T_s are all positive integers, $B \leq K$, $U \leqslant T_s$, and $S \leq P$; and

sending (S440) the first indication information.

2. The method according to claim 1, wherein the preset priority value is further related to a quantity Z of transport layers.

3. The method according to claim 2, wherein the preset priority value satisfies $pri(z,s_z) = Z \cdot f_5(s_z) + z$, wherein $s_z = 0,1,...,S-1$, $z = 1,2,...,Z$, $pri(z,s_z)$ represents a priority of a complex coefficient corresponding to an s_z^{th} reference signal port in the S reference signal ports at a z^{th} transport layer in the Z transport layers, $f_5(s_z)$ represents an index value of the s_z^{th} reference signal port that is at the z^{th} transport layer and that is determined based on K_z complex coefficients, $f_5(s_z) \in \{0,1,...,S-1\}$, K_z represents a quantity of complex coefficients at

the z^{th} transport layer, and $\sum_{z=1}^{Z} K_z = K$.

4. The method according to claim 2, wherein $T_0 = T_1 = ... = T_{S-1} = T \geq 2$, the prest priority value satisfies $pri(z, s_z, u_{s,z}) = Z \cdot S \cdot f_6(u_{s,z}) + Z \cdot f_5(s_z) + z$, wherein $s_z = 0,1,...,S-1$, $u_{s,z} = 0,1,...,U-1$, $z = 1,2,...,Z$, $\sum_{z=1}^{Z} K_z = K$ $pri(z, s_z, u_{s,z})$ represents a priority of a $u_{s,z}^{th}$ complex coefficient on an s_z^{th} reference signal port in the S reference signal ports at a z^{th} transport layer in the Z transport layers, $f_5(s_z)$ represents an index value of the s_z^{th} reference signal port that is at the z^{th} transport layer and that is determined based on K_z complex coefficients, $f_5(s_z) \in \{0,1,...,S-1\}$, K_z represents a quantity of complex coefficients at the z^{th} transport layer, $\sum_{z=1}^{Z} K_z = K$, $f_6(u_{s,z})$ represents an index value of the $u_{s,z}^{th}$ complex coefficient that is determined based on a complex coefficient corresponding to the s_z^{th} reference signal port at the z^{th} transport layer in the K_z complex coefficients, $f_6(u_{s,z}) \in \{0,1,...,U-1\}$, U is a positive integer, $U \leq T$, and $K \leq S \times U \times Z$.

5. The method according to claim 3, wherein $f_5(s_z) = s_z$, and at the z^{th} transport layer, the priority of the complex coefficient corresponding to the s_z^{th} reference signal port is higher than a priority of a complex coefficient corresponding to an $(s_z+1)^{th}$ reference signal port.

6. The method according to claim 4, wherein $f_5(s_z) = s_z$, and at the z^{th} transport layer, a priority of a u^{th} complex coefficient corresponding to the s_z^{th} reference signal port is higher than a priority of a u^{th} complex coefficient corresponding to an $(s_z+1)^{th}$ reference signal port, wherein the u^{th} complex coefficient corresponding to the s_z^{th} reference signal port is a complex coefficient whose index value is u on the s_z^{th} reference signal port, the u^{th} complex coefficient corresponding to the $(s_z+1)^{th}$ reference signal port is a complex coefficient whose index value is u on the $(s_z+1)^{th}$ reference signal port, and $u = 0,1,...,U-1$.

7. The method according to claim 4, wherein $f_6(u_{s,z}) = u_{s,z}$, and on the s_z^{th} reference signal port at the z^{th} transport layer, a smaller value of $u_{s,z}$ indicates a higher priority of a corresponding $u_{s,z}^{th}$ complex coefficient.

8. The method according to claim 6 or 7, wherein a smaller value of $pri(z, s_z, u_{s,z})$ indicates a higher priority of the $u_{s,z}^{th}$ complex coefficient corresponding to the s_z^{th} reference signal port at

the z^{th} transport layer.

9. A channel information feedback method, comprising:

receiving (S440) first indication information, wherein the first indication information is determined based on a precoded reference signal, and the precoded reference signal corresponds to P reference signal ports; the first indication information indicates B complex coefficients, the B complex coefficients are determined from K complex coefficients according to a preset priority value, the K complex coefficients are determined from a complex coefficient set, the complex coefficient set comprises U complex coefficients that are determined for an s^{th} reference signal port in S reference signal ports at each transport layer of Z transport layers, wherein s = 0, 1, ..., S−1, the S reference signal ports are a part or all of the P reference signal ports, the U complex coefficients are a part or all of T_s complex coefficients corresponding to the s^{th} reference signal port, and the preset priority value is related to at least one of the following: an index value of each complex coefficient in the K complex coefficients, an index value of a reference signal port corresponding to each complex coefficient in the K complex coefficients in the S reference signal ports, and an index value of each complex coefficient in the K complex coefficients in a plurality of complex coefficients that are allowed to be selected for a corresponding reference signal port; wherein P, B, K, S, Z, and T_s are all positive integers, $B \leq K$, $U \leqslant T_s$, and $S \leq P$; and

determining a precoding matrix based on the first indication information.

10. The method according to claim 9, wherein the preset priority value is further related to a quantity Z of transport layers.

11. The method according to claim 10, wherein the preset priority value satisfies $pri(z, s_z) = Z \cdot f_5(s_z) + z$, wherein $s_z = 0,1,...,S-1$, $z = 1,2,...,Z$, $pri(z, s_z)$ represents a priority of a complex coefficient corresponding to an s_z^{th} reference signal port in the S reference signal ports at a z^{th} transport layer in the Z transport layers, $f_5(s_z)$ represents an index value of the s_z^{th} reference signal port that is at the z^{th} transport layer and that is determined based on K_z complex coefficients, $f_5(s_z) \in \{0,1,...,S-1\}$, K_z represents a quantity of complex coefficients at the z^{th} transport layer, and $\sum_{z=1}^{Z} K_z = K$.

12. The method according to claim 10, wherein $T_0 = T_1 = ... = T_{S-1} = T \geq 2$, the preset priority value satisfies $pri(z, s_z, u_{s,z}) = Z \cdot S \cdot f_6(u_{s,z}) + Z \cdot f_5(s_z) + z$, wherein $s_z = 0,1,...,S-1$,

$u_{s,z} = 0,1,...,U-1$, $z = 1,2,...,Z$, $\sum_{z=1}^{Z} K_z = K$ $pri(z, s_z, u_{s,z})$ represents a priority of a $u_{s,z}$th complex coefficient on an s_zth reference signal port in the S reference signal ports at a zth transport layer in the Z transport layers, $f_5(s_z)$ represents an index value of the s_zth reference signal port that is at the zth transport layer and that is determined based on K_z complex coefficients, $f_5(s_z) \in \{0,1,...,S-1\}$, K_z represents a quantity of complex coefficients at the zth transport layer, $\sum_{z=1}^{Z} K_z = K$, $f_6(u_{s,z})$ represents an index value of the $u_{s,z}$th complex coefficient that is determined based on a complex coefficient corresponding to the s_zth reference signal port at the zth transport layer in the K_z complex coefficients, $f_6(u_{s,z}) \in \{0,1,...,U-1\}$, U is a positive integer, U ≤ T, and K ≤ S × U × Z.

13. The method according to claim 11, wherein $f_5(s_z) = s_z$, and at the zth transport layer, the priority of the complex coefficient corresponding to the s_zth reference signal port is higher than a priority of a complex coefficient corresponding to an (s_z+1)th reference signal port.

14. The method according to claim 12, wherein $f_5(s_z) = s_z$, and at the zth transport layer, a priority of a uth complex coefficient corresponding to the s_zth reference signal port is higher than a priority of a uth complex coefficient corresponding to an (s_z+1)th reference signal port, wherein the uth complex coefficient corresponding to the s_zth reference signal port is a complex coefficient whose index value is u on the s_zth reference signal port, the uth complex coefficient corresponding to the (s_z+1)th reference signal port is a complex coefficient whose index value is u on the (s_z+1)th reference signal port, and $u = 0,1,...,U-1$.

15. The method according to claim 12, wherein $f_6(u_{s,z}) = u_{s,z}$, and on the s_zth reference signal port at the zth transport layer, a smaller value of $u_{s,z}$ indicates a higher priority of a corresponding $u_{s,z}$th complex coefficient.

16. The method according to claim 12 or 15, wherein a smaller value of $pri(z, s_z, u_{s,z})$ indicates a higher priority of the $u_{s,z}$th complex coefficient corresponding to the s_zth reference signal port at the zth transport layer.

17. A communication apparatus (1000), comprising:

a processing unit (1100), configured to generate first indication information, wherein the first

indication information is determined based on a received precoded reference signal, and the precoded reference signal corresponds to P reference signal ports; the first indication information indicates B complex coefficients, the B complex coefficients are determined from K complex coefficients according to a preset priority value, the K complex coefficients are determined from a complex coefficient set, the complex coefficient set comprises U complex coefficients that are determined for an s^{th} reference signal port in S reference signal ports at each transport layer of Z transport layers, wherein s = 0, 1, ..., S−1, the S reference signal ports are a part or all of the P reference signal ports, the U complex coefficients are a part or all of T_s complex coefficients corresponding to the s^{th} reference signal port, and the preset priority value is related to at least one of the following: an index value of each complex coefficient in the K complex coefficients, an index value of a reference signal port corresponding to each complex coefficient in the K complex coefficients in the S reference signal ports, and an index value of each complex coefficient in the K complex coefficients in a plurality of complex coefficients that are allowed to be selected for a corresponding reference signal port; wherein P, B, K, S, Z, and T_s are all positive integers, $B \leq K$, $U \leqslant T_s$, and $S \leq P$; and

a transceiver unit (1200), configured to send the first indication information.

18. The apparatus (1000) according to claim 17, wherein the preset priority value is further related to a quantity Z of transport layers.

19. The apparatus (1000) according to claim 18, wherein the preset priority value satisfies $pri(z, s_z) = Z \cdot f_5(s_z) + z$, wherein $s_z = 0,1,...,S-1$, $z = 1,2,...,Z$, $pri(z, s_z)$ represents a priority of a complex coefficient corresponding to an s_z^{th} reference signal port in the S reference signal ports at a z^{th} transport layer in the Z transport layers, $f_5(s_z)$ represents an index value of the s_z^{th} reference signal port that is at the z^{th} transport layer and that is determined based on K_z complex coefficients, $f_5(s_z) \in \{0,1,...,S-1\}$, K_z represents a quantity of complex coefficients at the z^{th} transport layer, and $\sum_{z=1}^{Z} K_z = K$.

20. The apparatus (1000) according to claim 18, wherein $T_0 = T_1 = ... = T_{S-1} = T \geq 2$, the preset priority value satisfies $pri(z, s_z, u_{s,z}) = Z \cdot S \cdot f_6(u_{s,z}) + Z \cdot f_5(s_z) + z$, wherein $s_z = 0,1,...,S-1$, $u_{s,z} = 0,1,...,U-1$, $z = 1,2,...,Z$, $\sum_{z=1}^{Z} K_z = K$ $pri(z, s_z, u_{s,z})$ represents a priority of a $u_{s,z}^{th}$ complex coefficient on an s_z^{th} reference signal port in the S reference signal ports

at a z^{th} transport layer in the Z transport layers, $f_5(s_z)$ represents an index value of the s_z^{th} reference signal port that is at the z^{th} transport layer and that is determined based on K_z complex coefficients, $f_5(s_z) \in \{0,1,...,S-1\}$, K_z represents a quantity of complex coefficients at the z^{th} transport layer, $\sum_{z=1}^{Z} K_z = K$, $f_6(u_{s,z})$ represents an index value of the $u_{s,z}^{th}$ complex coefficient that is determined based on a complex coefficient corresponding to the s_z^{th} reference signal port at the z^{th} transport layer in the K_z complex coefficients, $f_6(u_{s,z}) \in \{0,1,...,U-1\}$, U is a positive integer, $U \leq T$, and $K \leq S \times U \times Z$.

21. The apparatus (1000) according to claim 19, wherein $f_5(s_z) = s_z$, and at the z^{th} transport layer, the priority of the complex coefficient corresponding to the s_z^{th} reference signal port is higher than a priority of a complex coefficient corresponding to an $(s_z+1)^{th}$ reference signal port.

22. The apparatus (1000) according to claim 20, wherein $f_5(s_z) = s_z$, and at the z^{th} transport layer, a priority of a u^{th} complex coefficient corresponding to the s_z^{th} reference signal port is higher than a priority of a u^{th} complex coefficient corresponding to an $(s_z+1)^{th}$ reference signal port, wherein the u^{th} complex coefficient corresponding to the s_z^{th} reference signal port is a complex coefficient whose index value is u on the s_z^{th} reference signal port, the u^{th} complex coefficient corresponding to the $(s_z+1)^{th}$ reference signal port is a complex coefficient whose index value is u on the $(s_z+1)^{th}$ reference signal port, and $u = 0,1,...,U-1$.

23. The apparatus (1000) according to claim 20, wherein $f_6(u_{s,z}) = u_{s,z}$, and on the s_z^{th} reference signal port at the z^{th} transport layer, a smaller value of $u_{s,z}$ indicates a higher priority of a corresponding $u_{s,z}^{th}$ complex coefficient.

24. The apparatus (1000) according to claim 22 or 23, wherein a smaller value of $pri(z, s_z, u_{s,z})$ indicates a higher priority of the $u_{s,z}^{th}$ complex coefficient corresponding to the s_z^{th} reference signal port at the z^{th} transport layer.

25. A communication apparatus (1000), comprising:

a transceiver unit (1200), configured to receive first indication information, wherein the first indication information is determined based on a precoded reference signal, and the precoded reference signal corresponds to P reference signal ports; the first indication information indicates B complex coefficients, the B complex coefficients are determined from K complex coefficients

according to a preset priority value, the K complex coefficients are determined from a complex coefficient set, the complex coefficient set comprises U complex coefficients that are determined for an s^{th} reference signal port in S reference signal ports at each transport layer of Z transport layers, wherein s = 0, 1, ..., S−1, the S reference signal ports are a part or all of the P reference signal ports, the U complex coefficients are a part or all of T_s complex coefficients corresponding to the s^{th} reference signal port, and the preset priority value is related to at least one of the following: an index value of each complex coefficient in the K complex coefficients, an index value of a reference signal port corresponding to each complex coefficient in the K complex coefficients in the S reference signal ports, and an index value of each complex coefficient in the K complex coefficients in a plurality of complex coefficients that are allowed to be selected for a corresponding reference signal port; wherein P, B, K, S, Z, and T_s are all positive integers, $B \leq K$, $U \leqslant T_s$, and $S \leq P$; and

a processing unit (1100), configured to determine a precoding matrix based on the first indication information.

26. The apparatus (1000) according to claim 25, wherein the preset priority value is further related to a quantity Z of transport layers.

27. The apparatus (1000) according to claim 26, wherein the preset priority value satisfies $pri(z, s_z) = Z \cdot f_5(s_z) + z$, wherein $s_z = 0,1,...,S-1$, $z = 1,2,...,Z$, $pri(z, s_z)$ represents a priority of a complex coefficient corresponding to an s_z^{th} reference signal port in the S reference signal ports at a z^{th} transport layer in the Z transport layers, $f_5(s_z)$ represents an index value of the s_z^{th} reference signal port that is at the z^{th} transport layer and that is determined based on K_z complex coefficients, $f_5(s_z) \in \{0,1,...,S-1\}$, K_z represents a quantity of complex coefficients at the z^{th} transport layer, and $\sum_{z=1}^{Z} K_z = K$.

28. The apparatus (1000) according to claim 26, wherein $T_0 = T_1 = ... = T_{S-1} = T \geq 2$, the preset priority value satisfies $pri(z, s_z, u_{s,z}) = Z \cdot S \cdot f_6(u_{s,z}) + Z \cdot f_5(s_z) + z$, wherein $s_z = 0,1,...,S-1$, $u_{s,z} = 0,1,...,U-1$, $z = 1,2,...,Z$, $\sum_{z=1}^{Z} K_z = K$ $pri(z, s_z, u_{s,z})$ represents a priority of a $u_{s,z}^{th}$ complex coefficient on an s_z^{th} reference signal port in the S reference signal ports at a z^{th} transport layer in the Z transport layers, $f_5(s_z)$ represents an index value of the s_z^{th} reference signal port

that is at the z^{th} transport layer and that is determined based on K_z complex coefficients, $f_5(s_z) \in \{0,1,...,S-1\}$, K_z represents a quantity of complex coefficients at the z^{th} transport layer, $\sum_{z=1}^{Z} K_z = K$, $f_6(u_{s,z})$ represents an index value of the $u_{s,z}^{th}$ complex coefficient that is determined based on a complex coefficient corresponding to the s_z^{th} reference signal port at the z^{th} transport layer in the K_z complex coefficients, $f_6(u_{s,z}) \in \{0,1,...,U-1\}$, U is a positive integer, $U \leq T$, and $K \leq S \times U \times Z$.

29. The apparatus (1000) according to claim 27, wherein $f_5(s_z) = s_z$, and at the z^{th} transport layer, the priority of the complex coefficient corresponding to the s_z^{th} reference signal port is higher than a priority of a complex coefficient corresponding to an $(s_z+1)^{th}$ reference signal port.

30. The apparatus (1000) according to claim 28, wherein $f_5(s_z) = s_z$, and at the z^{th} transport layer, a priority of a u^{th} complex coefficient corresponding to the s_z^{th} reference signal port is higher than a priority of a u^{th} complex coefficient corresponding to an $(s_z+1)^{th}$ reference signal port, wherein the u^{th} complex coefficient corresponding to the s_z^{th} reference signal port is a complex coefficient whose index value is u on the s_z^{th} reference signal port, the u^{th} complex coefficient corresponding to the $(s_z+1)^{th}$ reference signal port is a complex coefficient whose index value is u on the $(s_z+1)^{th}$ reference signal port, and $u = 0,1,...,U-1$.

31. The apparatus (1000) according to claim 28, wherein $f_6(u_{s,z}) = u_{s,z}$, and on the s_z^{th} reference signal port at the z^{th} transport layer, a smaller value of $u_{s,z}$ indicates a higher priority of a corresponding $u_{s,z}^{th}$ complex coefficient.

32. The apparatus (1000) according to claim 30 or 31, wherein a smaller value of $pri(z, s_z, u_{s,z})$ indicates a higher priority of the $u_{s,z}^{th}$ complex coefficient corresponding to the s_z^{th} reference signal port at the z^{th} transport layer.

33. A communication apparatus, comprising at least one processor, wherein the at least one processor is configured to execute a computer program stored in a memory, to enable the apparatus to implement the method according to any one of claims 1 to 16.

34. A communication apparatus, comprising:

a communication interface, configured to input and/or output information; and

a processor, configured to execute a computer program, to enable the apparatus to implement

the method according to any one of claims 1 to 16.

35. A communication apparatus, comprising:

a memory, configured to store a computer program; and

a processor, configured to invoke the computer program from the memory and execute the computer program, to enable the apparatus to implement the method according to any one of claims 1 to 16.

36. A computer-readable storage medium, comprising a computer program, wherein when the computer program is run on a computer, the computer is enabled to perform the method according to any one of claims 1 to 16.

37. A computer program product, wherein the computer program product comprises a computer program, and when the computer program is run on a computer, the computer is enabled to perform the method according to any one of claims 1 to 16.

38. A communication system comprising at least one first communication apparatus as claimed in any one of claims 1 to 8 and at least one second communication apparatus as claimed in any one of claims 9 to 16.