CLAIMS

1. An uplink pre-coding method, comprising:

transmitting, by a terminal device, a sounding reference signal (SRS) on at least one SRS resource;

receiving, by the terminal device, downlink control information (DCI) for scheduling uplink data transmission from a network side, wherein the DCI comprises an SRS resource indication (SRI);

determining, by the terminal device, a pre-coding scheme for uplink data according to the at least one SRS resource and the SRI;

pre-coding, by the terminal device, the uplink data according to the pre-coding scheme; and

sending, by the terminal device, the pre-coded uplink data;

wherein

determining, by the terminal device, the pre-coding scheme for the uplink data according to the at least one SRS resource and the SRI comprises:

determining one or more target SRS resources from the at least one SRS resource according to the SRI; and

determining the pre-coding scheme for the uplink data according to the pre-coding scheme for the one or more target SRS resources; and

the DCI does not comprise information for indicating a pre-coding matrix for the uplink data or indication information of a transmission layer number.

2. The method of claim 1, wherein

the pre-coding scheme comprises at least one of: a beam for analogue domain beamforming, or the pre-coding matrix for digital domain pre-coding.

3. The method of claim 1, wherein

a single antenna port is adopted for each of the at least one SRS resource;

or, N antenna ports are adopted for each of the at least one SRS resource;

or, the at least one SRS resource comprises K SRS resources, and k antenna ports are adopted for a k^{th} SRS resource of the K SRS resources,

where N is a number of ports for uplink data transmission, $1 \le k \le K$, $K \le N$.

4. The method of claim 1, wherein

the terminal device determines a beam for transmitting the SRS according to downlink channel information obtained from a downlink signal.

5. The method of claim 1, wherein

the terminal device determines the transmission layer number according to a number of ports for the one or more target SRS resources or a number of the one or more target SRS resources.

6. The method of claim 1,

further comprising:

determining, by the terminal device, a manner for determining the pre-coding scheme for the uplink data according to indication information of the pre-coding scheme acquired from the network side or a number of ports adopted for the at least one SRS resource.

7. The method of claim 1,

further comprising:

determining the pre-coding scheme based on downlink channel information obtained from a downlink signal.

8. A terminal device, comprising an information processing unit, a pre-coding scheme determination unit and an uplink data processing unit, wherein

the information processing unit is configured to transmit a sounding reference signal (SRS) on at least one SRS resource and receive downlink control information (DCI) for scheduling uplink data transmission from a network side, wherein the DCI comprises an SRS resource indication (SRI);

the pre-coding scheme determination unit is configured to determine a pre-coding scheme for uplink data according to the at least one SRS resource and the SRI; and

the uplink data processing unit is configured to pre-code the uplink data

according to the pre-coding scheme and send the pre-coded uplink data;

wherein

the pre-coding scheme determination unit is specifically configured to determine one or more target SRS resources from the at least one SRS resource according to the SRI, and determine the pre-coding scheme for the uplink data according to the pre-coding scheme for the one or more target SRS resources; and

the DCI does not comprise information for indicating a pre-coding matrix for the uplink data or indication information of a transmission layer number.

9. The terminal device of claim 8, wherein

the pre-coding scheme comprises at least one of: a beam for analogue domain beamforming, or the pre-coding matrix for digital domain pre-coding.

10. The terminal device of claim 8, wherein

a single antenna port is adopted for each of the at least one SRS resource;

or, N antenna ports are adopted for each of the at least one SRS resource;

or, the at least one SRS resource comprises K SRS resources, and k antenna ports are adopted for the k^{th} SRS resource of the K SRS resources,

where N is a number of ports for uplink data transmission, $1 \le k \le K$, $K \le N$.

11. The terminal device of claim 8, wherein

the information processing unit determines a beam for transmitting the SRS according to downlink channel information obtained from a downlink signal.

12. The terminal device of claim 8, wherein

the pre-coding scheme determination unit is configured to determine the transmission layer number according to a number of ports for the one or more target SRS resources or a number of the one or more target SRS resources.

13. The terminal device of claim 8, wherein

the pre-coding scheme determination unit is configured to determine a manner for determining the pre-coding scheme for the uplink data according to indication information of the pre-coding scheme acquired from the network side or a number of

ports for the at least one SRS resource.

14. The terminal device of claim 8, wherein

the pre-coding scheme is determined based on downlink channel information obtained from a downlink signal.