Claims

1. A user equipment, UE, comprising:

a receiver configured to receive:

channel state information, CSI, configuration information that indicates a first reference signal, RS, resource and a plurality of index groups that respectively correspond to a plurality of ranks, wherein each index group of the plurality of index groups comprises at least one index that indicates a port of the first RS resource,

a first signaling that indicates a first port group, and

the first RS resource; and

a transmitter configured to transmit first CSI reporting comprising a first rank of the plurality of ranks and a channel quality information, CQI,

wherein a measurement for the first RS resource is used for generating the first CSI reporting, the first rank corresponds to an index group of the plurality of index groups that indicates a reference port group, the CQI is calculated using at least one port in the reference port group, and the first rank is selected from ranks, of the plurality of ranks, having index groups that indicate a corresponding at least one index that is associated with the first port group.

2. The UE according to claim 1, wherein the ranks, of the plurality of ranks, have index groups for which each index is associated with the first port group, and the CQI is calculated using all ports in the reference port group.

3. The UE according to claim 1, wherein the CQI is calculated using all ports in the reference port group that are associated only with the first port group.

4. The UE according to claim 3, wherein a number of ports of the reference port group is equal to the first rank, a target port group comprises all ports in the reference port group that are associated with the first port group, and a rank that is used in the calculation of the CQI is equal to a number of ports of the target port group.

5. The UE according to claim 3, wherein the rank used in the calculation of the CQI is equal to the first rank only when each port in the reference port group is associated with the first port group.

6. The UE according to claim 1, wherein the first CSI reporting is sent only when at least one rank of the plurality of ranks has index groups that indicate a corresponding at least one index that is associated with the first port group.

7. The UE according to claim 1, wherein:

the receiver is configured to:

receive at least one RS resource other than the first RS resource in a first RS resource group, and

receive a second RS resource group, and

the first RS resource group is configured for channel measurement, the second RS resource group is configured for interference measurement, the first CSI reporting comprises a first RS resource indicator, and the first RS resource indicator is used for indicating the first RS resource from the first RS resource group. and the first rank and the CQI are obtained using the first RS resource indicator.

8. A base station, comprising:

a transmitter configured to transmit:

channel state information, CSI, configuration information that indicates a first reference signal, RS, resource and a plurality of index groups that respectively correspond to a plurality of ranks, wherein each index group of the plurality of index groups comprises at least one index that indicates a port of the first RS resource,

a first signaling that indicates a first port group, and

the first RS resource; and

a receiver configured to receive first CSI reporting comprising a first rank of the plurality of ranks and a channel quality information, CQI,

wherein a measurement for the first RS resource is used for generating the first CSI reporting, the first rank corresponds to an index group of the plurality of index groups that indicates a reference port group, the CQI is calculated using at least one port in the reference port group, and the first rank is selected from ranks, of the plurality of ranks, having index groups that indicate a corresponding at least one index that is associated with the first port group.

9. A method in a user equipment (UE), comprising:

receiving channel state information, CSI, configuration information that indicates a first reference signal, RS, resource and a plurality of index groups that respectively correspond to a plurality of ranks, wherein each index group of the plurality of index groups comprises at least one index that indicates a port of the first RS resource;

receiving a first signaling that indicates a first port group;

receiving the first RS resource; and

transmitting first CSI reporting comprising a first rank of the plurality of ranks and a channel quality information, CQI,

wherein a measurement for the first RS resource is used for generating the first CSI reporting, the first rank corresponds to an index group of the plurality of index groups that indicates a reference port group, the CQI is calculated using at least one port in the reference port group, and the first rank is selected from ranks, of the plurality of ranks, having index groups that indicate a corresponding at least one index that is associated with the first port group.

10. The method according to claim 9, wherein the ranks, of the plurality of ranks, have index groups for which each index is associated with the first port group, and the CQI is calculated using all ports in the reference port group.

11. The method according to claim 9, wherein the CQI is calculated using all ports in the reference port group that are associated only with the first port group.

12. The method according to claim 11, wherein a number of ports of the reference port group is equal to the first rank, a target port group comprises all ports in the reference port group that are associated with the first port group, and a rank that is used in the calculation of the CQI is equal to a number of ports of the target port group.

13. The method according to claim 11, wherein the rank used in the calculation of the CQI is equal to the first rank only when each port in the reference port group is associated with the first port group.

14. The method according to claim 9, wherein the first CSI reporting is sent only when at least one rank of the plurality of ranks has index groups that indicate a corresponding at least one index that is associated with the first port group.

15. A method in a base station, comprising:

transmitting channel state information, CSI, configuration information that indicates a first reference signal, RS, resource and a plurality of index groups that respectively correspond to a plurality of ranks, wherein each index group of the plurality of index groups comprises at least one index that indicates a port of the first RS resource;

transmitting a first signaling that indicates a first port group;

transmitting the first RS resource; sending first CSI configuration information; sending a first signaling; sending a first RS resource; and

receiving first CSI reporting comprising a first rank of the plurality of ranks and a channel quality information, CQI,

wherein a measurement for the first RS resource is used for generating the first CSI reporting, the first rank corresponds to an index group of the plurality of index groups that indicates a reference port group, the CQI is calculated using at least one port in the reference port group, and the first rank is selected from ranks, of the plurality of ranks, having index groups that indicate a corresponding at least one index that is associated with the first port group.