[0006] In a first aspect, the present disclosure provides a reporting communication apparatus comprising: a receiver configured to receive a measurement signal; circuitry configured to measure channel state information (CSI) of the received measurement signal; and a transmitter configured to transmit a report frame including information of a sub-component of the CSI, wherein the receiver is connected to one or more receive antennas and receives the measurement signal from an initiating communication apparatus connected to one or more transmit antennas; and the information of a sub-component of the CSI has a scaled value using a scaling factor that is calculated for each transmit antenna and receive antenna pair.

[0007] In a second aspect, the present disclosure provides a reporting communication method comprising: receiving a measurement signal by a receiver connected to one or more receive antennas from an initiating communication apparatus connected to one or more receive antennas; measuring channel state information (CSI) of the received measurement signal; and transmitting a report frame carrying information of a sub-component of the CSI, wherein the information of a sub-component of the CSI has a scaled value using a scaling factor that is calculated for each transmit and receive antenna pair.

[0008] In a third aspect, the present disclosure provides an initiating communication apparatus comprising: a transmitter connected to one or more transmit antennas and configured to send measurement signal to a reporting communication apparatus connected to one or more receive antennas; circuitry configured to generate a frame carrying a report type indication indicating a sub-component of a CSI to the reporting communication apparatus; and a receiver configured to receive a report frame carrying information of the sub-component of the CSI of a measurement signal from the reporting communication apparatus, the information of a sub-component of the CSI has a scaled value using a scaling factor that is calculated for each transmit and receive antenna pair.

[0009] In a fourth aspect, the present disclosure provides an initiating communication method comprising: sending measurement signal to a reporting communication apparatus by a transmitter connected to one or more transmit antennas from a reporting communication

apparatus connected to one or more receive antennas; generating a frame carrying a report type indication indicating a sub-component of a CSI to the reporting communication apparatus; receiving a report frame carrying information of the sub-component of the CSI of a measurement signal from the reporting communication apparatus, the information of a sub-component of the CSI has a scaled value using a scaling factor that is calculated for each transmit and receive antenna pair.

[0010] Additional benefits and advantages of the disclosed embodiments will become apparent from the specification and drawings. The benefits and/or advantages may be individually obtained by the various embodiments and features of the specification and drawings, which need not all be provided in order to obtain one or more of such benefits and/or advantages.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] The accompanying figures, where like reference numerals refer to identical or functionally similar elements throughout the separate views and which together with the detailed description below are incorporated in and form part of the specification, serve to

CLAIMS

1. A reporting communication apparatus comprising:

a receiver configured to receive a measurement signal;

circuitry configured to measure channel state information (CSI) of the received measurement signal; and

a transmitter configured to transmit a report frame including information of a sub-component of the CSI,

wherein the receiver is connected to one or more receive antennas and receives the measurement signal from an initiating communication apparatus connected to one or more transmit antennas; and

the information of a sub-component of the CSI has a scaled value using a scaling factor that is calculated for each transmit antenna and receive antenna pair.

2, The reporting communication apparatus according to claim 1, wherein the report frame further includes the scaling factor that is calculated for each transmit and receive antenna pair.

3. The reporting communication apparatus according to claim 1, further comprising:

the receiver further configured to receive a frame, from the initiating communication apparatus, carrying a report type indication indicating a sub-component of the CSI, wherein the transmitter configured to transmit the report frame carrying the information of the indicated sub-component of the CSI to the initiating communication apparatus.

4. The reporting communication apparatus according to claim 1, wherein the sub-component of the CSI is one of an amplitude, a phase, a real part and an imaginary part of the CSI.

5. The reporting communication apparatus according to claim 3, wherein the frame carrying the report type indication is received during one of a sensing session setup phase and a sensing measurement setup phase, the report type indication for different measurement

instances corresponding to the one of the sensing session setup phase and the sensing measurement setup phase is identical.

6. The reporting communication apparatus according to claim 1, wherein the transmitter transmits the report frame immediately after a short interframe space of the received measurement signal.

7. The reporting communication apparatus according to claim 1, wherein the transmitter configured to transmit the report frame at a time delay after the measurement signal is received, the time delay after the measurement signal is received being one of immediately after a short interframe space of a subsequently received measurement signal and in a subsequent transmission opportunity.

8. The reporting communication apparatus according to claim 1, wherein the transmitter/receiver further configured to transmit/receive a sensing session setup request/response frame to/from the initiating communication apparatus during a sensing session setup phase to set a maximum time delay to transmit the report frame after the measurement signal is received, respectively.

9. The reporting communication apparatus according to claim 4, wherein the sub-component is the amplitude, the information of the sub-component of the CSI is encoded as an unsigned integer(s).

10. The reporting communication apparatus according to claim 1, wherein the information comprises a maximum absolute value of measured values of the sub-component of the CSI.

11. The reporting communication apparatus according to 1, wherein the information comprises a single matrix of values of the sub-component corresponding to a group of subcarriers which are grouped based on a grouping parameter, the grouping parameter having a value different from that for reporting a beamforming feedback matrix.

12. The reporting communication apparatus according to claim 1, wherein the frame is a null data packet announcement frame received immediately prior to the received measurement signal.

13. The reporting communication apparatus according to claim 10, wherein the frame carrying the report type indication is received during each measurement instance corresponding to a sensing measurement setup, and the report type indication for different CSI measurement instances corresponding to the sensing measurement setup phase is different.

14. The reporting communication apparatus according to claim 1, wherein the information of the sub-component comprises measured values of the sub-component of the CSI, the measured values being encoded using a base-2 numeral system.

15. The reporting communication apparatus according to claim 1, the receiver further configured to receive a first frame and a second frame from the initiating communication apparatus, the first frame being received during one of a sensing session setup phase and a sensing measurement setup phase and carrying a coarse report type indication indicating whether a full CSI or a partial CSI is to be reported, the second frame carrying a fine report type indication indicating whether the full CSI being compressed/uncompressed or a sub-component of the partial CSI, respectively, wherein the transmitter transmits the report frame carrying information of the indicated compressed/uncompressed full CSI or the indicated sub-component of the partial CSI to the initiating communication apparatus, respectively.

16. The reporting communication apparatus according to claim 1, wherein the information of the sub-component is retrieved based on lookup tables.

17. The reporting communication apparatus according to claim 1, wherein the information comprises a parameter relating to a number of bits used to encode original values of the CSI of the received measurement signal.

18. The reporting communication apparatus according to claim 1, wherein the information comprises an index of a lookup table which corresponds to a measured value of the sub-component.

19. A reporting communication method comprising:

receiving a measurement signal by a receiver connected to one or more receive antennas from an initiating communication apparatus connected to one or more receive antennas;

measuring channel state information (CSI) of the received measurement signal; and

transmitting a report frame carrying information of a sub-component of the CSI, wherein

the information of a sub-component of the CSI has a scaled value using a scaling factor that is calculated for each transmit and receive antenna pair.

20. An initiating communication apparatus comprising:

a transmitter connected to one or more transmit antennas and configured to send measurement signal to a reporting communication apparatus connected to one or more receive antennas;

circuitry configured to generate a frame carrying a report type indication indicating a sub-component of CSI to the reporting communication apparatus; and

a receiver configured to receive a report frame carrying information of the sub-component of the CSI of a measurement signal from the reporting communication apparatus,

the information of a sub-component of the CSI has a scaled value using a scaling factor that is calculated for each transmit and receive antenna pair

21. An initiating communication method comprising:

sending measurement signal to a reporting communication apparatus by a transmitter connected to one or more transmit antennas from a reporting communication apparatus connected to one or more receive antennas;

generating a frame carrying a report type indication indicating a sub-component of CSI to the reporting communication apparatus;

receiving a report frame carrying information of the sub-component of the CSI of a measurement signal from the reporting communication apparatus,

the information of a sub-component of the CSI has a scaled value using a scaling factor that is calculated for each transmit and receive antenna pair.