

CLAIMS

1. A method of receiving data in a wireless communication system, comprising:

determining a channel estimate for each of multiple cells (104a, 104b, 104c) by a user equipment (UE) (120); characterized by further comprising the steps of:

computing a receive filter based at least on a channel estimate of a serving cell in the multiple cells (104a, 104b, 104c);

generating a virtual channel vector by applying the receive filter to the channel estimates for said each of the multiple cells (104a, 104b, 104c);

sending the virtual channel vector from the UE (120) to at least one of the multiple cells (104a, 104b, 104c); and

receiving a data transmission sent by the multiple cells (104a, 104b, 104c) to the UE (120) based on the virtual channel vector.

2. The method of claim 1, wherein the data transmission comprises:

at least one data stream, the at least one data stream being received by the UE (120) from the multiple cells (104a, 104b, 104c); or,

multiple data streams, each data stream being received by the UE (120) from one of the multiple cells (104a, 104b, 104c).

3. The method of claim 1, wherein the data transmission is received from the multiple cells (104a, 104b, 104c) on resources utilized in common with a second UE (120), or is received from the multiple cells (104a, 104b, 104c) on resources not used to send data transmissions to other UEs (120).

4. The method of claim 1, wherein the data transmission comprises at least one data stream, the at least one data stream being sent with precoding determined from a component of the virtual channel vector.

5. The method of claim 1, wherein the data transmission comprises a single data stream sent with precoding based on a precoding vector determined from the virtual channel vector.

6. The method of claim 1, wherein the multiple cells (104a, 104b, 104c) are each equipped with a single transmit antenna, wherein the UE (120) is equipped with multiple receive antennas, and wherein generating the virtual channel vector comprises:

determining a channel vector for each of the multiple cells (104a, 104b, 104c),
and

determining a channel gain for each cell based on the channel vector for the cell and the receive filter.

7. The method of claim 1, wherein the multiple cells (104a, 104b, 104c) are associated with multiple antennas distributed at different locations.

8. The method of claim 1, wherein the virtual channel vector comprises a plurality of components, and wherein each component comprises a channel gain associated with a communications link between the UE (120) and one of the multiple cells (104a, 104b, 104c).

9. An apparatus for receiving data in a wireless communication system, comprising:

means for determining a channel estimate for each of multiple cells (104a, 104b, 104c) by a user equipment (UE) (120); characterized by further comprising:

means for computing a receive filter based at least on a channel estimate of a serving cell in the multiple cells (104a, 104b, 104c);

means for generating a virtual channel vector by applying the receive filter to the channel estimates for each of the multiple cells (104a, 104b, 104c);

means for sending the virtual channel vector from the UE (120) to at least one of the multiple cells (104a, 104b, 104c); and

means for receiving a data transmission sent by the multiple cells (104a, 104b, 104c) to the UE (120) based on the virtual channel vector.

10. A computer program product, comprising:

a computer-readable medium comprising:

code for causing at least one computer to carry out the method according to any one of claims 1 to 8.

11. A method of sending data in a wireless communication system, comprising:

receiving a virtual channel vector for multiple cells (104a, 104b, 104c) from a user equipment (UE) (120), characterized in that the virtual channel vector is generated at the UE (120) by applying a receive filter that is based at least on a channel estimate of a serving cell in the multiple cells to channel estimates determined at the UE (120) for each of the multiple cells (104a, 104b, 104c); and further characterized by comprising the step of

sending at least one data transmission from one of the multiple cells (104a, 104b, 104c) to the UE (120) based on the virtual channel vector, the data transmission being sent to the UE (120) in coordination with other cells in the multiple cells (104a, 104b, 104c).

12. The method of claim 11, wherein the data transmission for the UE (120) comprises:

at least one data stream, the at least one data stream being sent by the multiple cells (104a, 104b, 104c) to the UE (120); or,

multiple data streams, each of the multiple data streams being sent by one of the multiple cells (104a, 104b, 104c) to the UE (120).

13. The method of claim 11, wherein the sending the at least one data transmission comprises:

sending at least two data transmissions by the multiple cells (104a, 104b, 104c) to at least two UEs (120) on common resources; or,

sending a single data transmission by the multiple cells (104a, 104b, 104c) to the UE (120) on resources not used to send data transmissions to other UEs (120).

14. The method of claim 11, wherein the sending the at least one data transmission comprises:

determining at least one precoding vector based on the virtual channel vector; and,

sending each data transmission based on a respective precoding vector by the multiple cells (104a, 104b, 104c) to the UE (120).

15. The method of claim 14, wherein the at least one precoding vector is determined based on zero-forcing or minimum mean square error (MMSE) technique.

16. The method of claim 14, wherein each precoding vector comprises a weight for each of multiple transmit antennas at the multiple cells.

17. The method of claim 11, wherein each data transmission comprises at least one data stream, and wherein the sending the at least one data transmission comprises:

determining a precoding vector for each data stream based on the virtual channel vector; and,

sending each data stream based on the precoding vector for the data stream by the multiple cells.

18. The method of claim 11, further comprising:

determining precoding information for data transmissions to the UE (120) by the multiple cells (104a, 104b, 104c) based on information obtained from the virtual channel vector.

19. An apparatus for sending data in a wireless communication, comprising:

means for receiving a virtual channel vector for multiple cells (104a, 104b, 104c) from a user equipment (UE) (120), characterized in that the virtual channel vector is generated at the UE (120) by applying a receive filter that is based at least on a channel estimate of a serving cell in the multiple cells to channel estimates determined at the UE for each of the multiple cells (104a, 104b, 104c), (120); and further characterized by

means for sending at least one data transmission from one of the multiple cells (104a, 104b, 104c) to the UE (120) based on the virtual channel vector, the data transmission being sent to the UE (120) in coordination with other cells in the multiple cells (104a, 104b, 104c).