CLAIMS

What is claimed:

1. A method for Time Division Duplex (TDD) operation in a wireless transmit/receive unit (WTRU), the method comprising:

receiving a first TDD uplink (UL)/downlink (DL) reference configuration for a serving cell;

receiving a second TDD UL/DL reference configuration for the serving cell;

receiving a third TDD UL/DL reference configuration for the serving cell;

using the first TDD UL/DL reference configuration for timing of UL scheduling and UL Hybrid Automatic Repeat Request (HARQ);

using the second TDD UL/DL reference configuration for timing of DL scheduling and DL HARQ; and

using the third TDD UL/DL reference configuration as an indication for determining a UL or DL direction for each subframe;

wherein on a condition that the determined direction for a subframe is DL, receiving in the subframe in the DL.

2. The method of claim 1, wherein receiving in a subframe in the DL includes at least one of monitoring a Physical Downlink Control Channel (PDCCH), monitoring an enhanced PDCCH (EPDCCH), decoding a Physical Hybrid ARQ Indicator Channel (PHICH), and decoding a Physical Downlink Shared Channel (PDSCH).

3. The method of claim 1, wherein the first TDD UL/DL reference configuration is cell-specific.

4. The method of claim 1, wherein the second TDD UL/DL reference configuration is WTRU-specific.

5. The method of claim 1, further comprising:

cancelling a scheduled UL transmission for a specific subframe on a condition that the specific subframe is indicated as DL.

6. The method of claim 3, wherein the cell-specific TDD UL/DL reference configuration is provided to the WTRU in a system information block.

7. The method of claim 1, wherein on a condition that the WTRU does not receive the third TDD UL/DL reference configuration, the WTRU performs blind decoding in each subframe indicated as DL in the second TDD UL/DL reference configuration to determine whether the subframe is intended for DL use.

8. The method of claim 7, wherein blind decoding includes monitoring at least one of a Physical Downlink Control Channel (PDCCH) and an enhanced PDCCH (EPDCCH).

9. The method of claim 7, wherein blind decoding is not performed in a subframe in which the WTRU has a scheduled UL transmission and the WTRU transmits as scheduled in the subframe.

10. The method of claim 7, wherein the WTRU determines the direction of any subframe in which a Physical Hybrid ARQ Indicator Channel (PHICH) intended for the WTRU is expected by the WTRU to be DL.

11. The method of claim 1, further comprising:

receiving a format and a location of a special subframe as part of downlink control information (DCI) to allow for dynamic configuration of the special subframe.

12. The method of claim 1, further comprising:

receiving an updated TDD UL/DL configuration to replace at least one of the first TDD UL/DL reference configuration or the second TDD UL/DL reference configuration; and

mapping at least one of the previous ongoing UL/DL HARQ processes to at least one new UL/DL HARQ process corresponding to the updated TDD UL/DL configuration.

13. – 16. Canceled.

17. A method for Time Division Duplex (TDD) in an evolved Node B (eNB), the method comprising:

transmitting a first TDD uplink (UL)/downlink (DL) reference configuration for a cell;

transmitting a second TDD UL/DL reference configuration for the cell to at least one WTRU;

transmitting a third TDD UL/DL reference configuration for the cell to the at least one WTRU;

using for the at least one WTRU the first TDD UL/DL reference configuration for timing of UL scheduling and UL Hybrid Automatic Repeat Request (HARQ);

using for the at least one WTRU the second UL/DL reference configuration for timing of DL scheduling and DL HARQ;

using for the at least one WTRU the third UL/DL reference configuration as an indication for determining a UL or DL direction for each subframe; and

transmitting in the DL in at least one subframe which is UL in the first TDD UL/DL reference configuration.

18. The method of claim 17, wherein the eNB uses the first TDD UL/DL reference configuration for both the UL and DL scheduling and HARQ operations for at least one other WTRU.

19. The method of claim 17, wherein the first TDD UL/DL reference configuration is cell-specific.

20. The method of claim 17, wherein the second TDD UL/DL reference configuration is WTRU-specific.

21. A wireless transmit/receive unit (WTRU) for Time Division Duplex (TDD) operation comprising:

a receiver configured to receive a first TDD uplink (UL)/downlink (DL) reference configuration for a serving cell;

the receiver is further configured to receive a second TDD UL/DL reference configuration for the serving cell;

the receiver is further configured to receive a third TDD UL/DL reference configuration for the serving cell;

a processor configured to use the first TDD UL/DL reference configuration for timing of UL scheduling and UL Hybrid Automatic Repeat Request (HARQ);

the processor is further configured to use the second TDD UL/DL reference configuration for timing of DL scheduling and DL HARQ; and

the processor is further configured to use the third TDD UL/DL reference configuration as an indication for determining a UL or DL direction for each subframe;

wherein on a condition that the determined direction for a subframe is DL, receiving in the subframe in the DL.

22. The WTRU of claim 21, wherein receiving in a subframe in the DL includes at least one of monitoring a Physical Downlink Control Channel (PDCCH), monitoring an enhanced PDCCH (EPDCCH), decoding a Physical Hybrid ARQ Indicator Channel (PHICH), and decoding a Physical Downlink Shared Channel (PDSCH).

23. The WTRU of claim 21, wherein the first TDD UL/DL reference configuration is cell-specific.

24. The WTRU of claim 21, wherein the second TDD UL/DL reference configuration is WTRU-specific.

25. The method of claim 1, wherein the third TDD UL/DL reference configuration is WTRU-specific.

26. The method of claim 1, further comprising:

cancelling a transmission of a DL HARQ feedback in a specific subframe on a condition that the specific subframe is indicated as UL.

27. The method of claim 1, further comprising:

receiving an updated third TDD UL/DL reference configuration in a current reconfiguration period; and

applying the updated configuration in at least part of at least one of the current reconfiguration period and a next reconfiguration period.

28. The method of claim 27, wherein the reconfiguration period occurs periodically.

29. The method of claim 1, further comprising:

expecting to receive an updated third TDD UL/DL reference configuration in a reconfiguration period; and

on a condition that the updated third TDD UL/DL reference configuration is not received, blind decoding in a subframe indicated as a DL subframe in the second TDD UL/DL configuration until a later time when an updated third TDD UL/DL reference configuration is received.

CLAIMS

What is claimed:

1. A method for Time Division Duplex (TDD) operation in a wireless transmit/receive unit (WTRU), the method comprising:

receiving a first TDD uplink (UL)/downlink (DL) reference configuration for a serving cell;

receiving a second TDD UL/DL reference configuration for the serving cell;

receiving a third TDD UL/DL reference configuration for the serving cell;

using the first TDD UL/DL reference configuration for timing of UL scheduling and UL Hybrid Automatic Repeat Request (HARQ);

using the second TDD UL/DL reference configuration for timing of DL scheduling and DL HARQ; and

using the third TDD UL/DL reference configuration as an indication for determining a UL or DL direction for each subframe;

wherein on a condition that the determined direction for a subframe is DL, receiving in the subframe in the DL.

2. The method of claim 1, wherein receiving in a subframe in the DL includes at least one of monitoring a Physical Downlink Control Channel (PDCCH), monitoring an enhanced PDCCH (EPDCCH), decoding a Physical Hybrid ARQ Indicator Channel (PHICH), and decoding a Physical Downlink Shared Channel (PDSCH).

3. The method of claim 1, wherein the first TDD UL/DL reference configuration is cell-specific.

4. The method of claim 1, wherein the second TDD UL/DL reference configuration is WTRU-specific.

5. The method of claim 1, further comprising:

cancelling a scheduled UL transmission for a specific subframe on a condition that the specific subframe is indicated as DL.

6. The method of claim 1, wherein on a condition that the WTRU does not receive the third TDD UL/DL reference, the WTRU performs blind decoding in each subframe indicated as DL in the second TDD UL/DL reference configuration to determine whether the subframe is intended for DL use.

7. The method of claim 1, further comprising:

receiving an updated third TDD UL/DL reference configuration in a current reconfiguration period; and

applying the updated configuration in at least part of at least one of the current reconfiguration period and a next reconfiguration period.

8. The method of claim 1, further comprising:

receiving a format and a location of a special subframe as part of downlink control information (DCI) to allow for dynamic configuration of the special subframe.

9. The method of claim 1, further comprising:

receiving an updated TDD UL/DL configuration to replace at least one of the first TDD UL/DL reference configuration or the second TDD UL/DL reference configuration; and

mapping at least one of a previous ongoing UL/DL HARQ processes to at least one new UL/DL HARQ process corresponding to the updated TDD UL/DL configuration.

10. The method of claim 1, wherein the third TDD UL/DL reference configuration is WTRU-specific.

11. The method of claim 1, further comprising:

expecting to receive an updated third TDD UL/DL reference configuration in a reconfiguration period; and

on a condition that the updated third TDD UL/DL reference configuration is not received, blind decoding in a subframe indicated as a DL subframe in the second TDD UL/DL configuration until a later time when an updated third TDD UL/DL reference configuration is received.

12. A wireless transmit/receive unit (WTRU) for Time Division Duplex (TDD) operation comprising:

a receiver configured to receive a first TDD uplink (UL)/downlink (DL) reference configuration for a serving cell;

the receiver is further configured to receive a second TDD UL/DL reference configuration for the serving cell;

the receiver is further configured to receive a third TDD UL/DL reference configuration for the serving cell;

a processor configured to use the first TDD UL/DL reference configuration for timing of UL scheduling and UL Hybrid Automatic Repeat Request (HARQ);

the processor is further configured to use the second TDD UL/DL reference configuration for timing of DL scheduling and DL HARQ; and

the processor is further configured to use the third TDD UL/DL reference configuration as an indication for determining a UL or DL direction for each subframe;

wherein on a condition that the determined direction for a subframe is DL, receiving in the subframe in the DL.

13. The WTRU of claim 12, wherein receiving in a subframe in the DL includes at least one of monitoring a Physical Downlink Control Channel (PDCCH), monitoring an enhanced PDCCH (EPDCCH), decoding a Physical Hybrid ARQ Indicator Channel (PHICH), and decoding a Physical Downlink Shared Channel (PDSCH).

14. The WTRU of claim 12, wherein the first TDD UL/DL reference configuration is cell-specific.

15. The WTRU of claim 12, wherein the second TDD UL/DL reference configuration is WTRU-specific.