CLAIMS

1. A method for wireless communications by a network entity, comprising:

transmitting (802) at least one physical downlink control channel ~~(~~, PDCCH~~)~~, that schedules or triggers transmission of data, to or from a user equipment ~~(~~, UE~~),~~ as different copies of a same transport block ~~(~~, TB~~)~~, within a repetition window;

determining whether the UE is configured for repetition based transmission or reception of repetition-based transmission; and

taking (804) one or more actions~~,~~ in response to the determination when transmitting the at least one PDCCH, designed to improve reliability of reception by the UE~~.~~

~~2. The method of claim 1~~, wherein a single PDCCH schedules multiple copies of the TB~~.~~

~~3. The method of claim 2,~~ and wherein the one or more actions comprise:

utilizing an increased control channel element ~~(~~, CCE~~)~~, limit for at least one of a first transmission time interval ~~(~~, TTI~~)~~, of the repetition window; and

utilizing a CCE limit less than the increased CCE limit for one or more other TTIs in the repetition window wherein the increased CCE limit is determined at least in part based on a capability of the UE.

~~4~~2. The method of claim ~~3~~1, wherein:

the PDCCH is transmitted using an aggregation level of at least 16; and

the increased CCE limit accommodates at least two candidates at the aggregation level within a single TTI.

~~5. The method of claim 3, wherein the increased CCE limit is determined at least in part based on a capability of the UE.~~

~~6~~3. The method of claim 2, wherein the one or more actions comprise:

determining an appropriate aggregation level for transmitting the PDCCH; and

transmitting the PDCCH at the determined aggregation level.

~~7~~4. The method of claim ~~6~~3, wherein:

the PDCCH includes an information field to trigger the repetition based transmission of data, to or from the UE.

~~8~~5. The method of claim 1, wherein the one or more actions comprise:

transmitting multiple copies of the PDCCH with repetition in frequency.

96. The method of claim 85, wherein each copy of the PDCCH indicates a same physical downlink shared channel (, PDSCH), or series of PDSCHs within the repetition window.

107. The method of claim 85, wherein each copy of the PDCCH activates a grant-free repetition-based transmission.

11. The method of claim 1, wherein the one or more actions designed to improve reliability of reception of the PDCCH by the UE are taken only if the UE is configured for repetition-based transmission or reception of repetition-based transmission.

128. The method of claim 1, further comprising when the UE is configured to receive repetition based downlink transmissions, monitoring for hybrid automatic retransmission request (, HARQ), acknowledgment feedback from the UE after all copies of the downlink transmission are transmitted.

139. The method of claim 1, further comprising:

when the UE is configured to receive repetition based downlink transmissions, receiving hybrid automatic retransmission request (, HARQ), acknowledgment feedback indicating a copy of the downlink transmission was successfully received by the UE before the end of the repetition window; and

in response to the HARQ acknowledgment feedback, terminating the repetition based downlink transmissions early.

1410. A method for wireless communications by a user equipment (, UE), comprising:

monitoring (902) for at least one physical downlink control channel (, PDCCH), from a network entity that schedules or triggers transmission of data, to or from the UE, as different copies of a same transport block (, TB), within a repetition window, wherein the network entity takes one or more actions designed to improve reliability of reception of the PDCCH by the UE; and

participating (904) in the repetition based transmission scheduled or triggered by the at least one PDCCH.

15. The method wherein the one or more actions designed to improve reliability of claim 14reception of the PDCCH by the UE are taken only if the UE is configured for repetition-based transmission or reception of repetition-based transmission, wherein a single PDCCH schedules multiple copies of the TB.

~~16. The method of claim 15~~, wherein the one or more actions taken by the network entity comprise:

utilizing an increased control channel element ~~(~~, CCE~~)~~, limit for at least one of a first transmission time interval ~~(~~, TTI~~)~~, of the repetition window; and

utilizing a CCE limit less than the increased CCE limit for one or more other TTIs in the repetition window wherein the increased CCE limit is determined at least in part based on a capability of the UE.

~~17~~11. The method of claim ~~16, wherein:~~

~~the PDCCH is transmitted using an aggregation level of at least 16; and~~

~~the increased CCE limit accommodates at least two decoding candidates, monitored for by the UE, at the aggregation level within a single TTI.~~

~~18. The method of claim 16, wherein the increased CCE limit is determined at least in part based on capability of the UE.~~

~~19. The method of claim 15, wherein the one or more actions taken by the network entity comprise:~~

~~determining an appropriate aggregation level for transmitting the PDCCH; and~~

~~transmitting the PDCCH at the determined aggregation level.~~

~~20. The method of claim 19, wherein:~~

~~the PDCCH includes an information field to trigger the repetition based transmission of data, to or from the UE.~~

~~21. The method of claim 14, wherein the one or more actions taken by the network entity comprise:~~

~~transmitting multiple copies of the PDCCH with repetition in frequency.~~

~~22. The method of claim 21, wherein each copy of the PDCCH indicates a same physical downlink shared channel (PDSCH) or series of PDSCHs within the repetition window.~~

~~23. The method of claim 21, wherein each copy of the PDCCH activates a grant-free repetition-based transmission.~~

~~24. The method of claim 14, wherein the one or more actions designed to improve reliability of reception of the PDCCH by the UE are taken only if the UE is configured for repetition-based transmission or reception of repetition-based transmission.~~

~~25. The method of claim 14~~10, further comprising, when the UE is configured to receive repetition based downlink transmissions, providing hybrid automatic retransmission request ~~(~~, HARQ~~),~~ acknowledgment feedback after the last copy of the downlink transmission in the repetition window.

~~26~~12. The method of claim ~~14~~10, wherein, when the UE is configured to receive repetition based downlink transmission, the UE is configured to provide hybrid automatic retransmission request ~~(~~, HARQ~~),~~ acknowledgment feedback after each copy of the downlink transmission in the repetition window.

~~27~~13. An apparatus for wireless communications by a network entity, comprising:

means for transmitting at least one physical downlink control channel ~~(~~, PDCCH~~),~~ that schedules or triggers transmission of data, to or from a user equipment ~~(~~, UE~~)~~, as different copies of a same transport block ~~(~~, TB~~),~~ within a repetition window;

means for determining whether the UE is configured for repetition based transmission or reception of repetition-based transmission; and

means for taking one or more actions~~,~~ in response to the determination when transmitting the at least one PDCCH, designed to improve reliability of reception by the UE~~.~~, wherein a single PDCCH schedules multiple copies of the TB and wherein the one or more actions comprise:

utilizing an increased control channel element, CCE, limit for at least one of a first transmission time interval, TTI, of the repetition window; and

utilizing a CCE limit less than the increased CCE limit for one or more other TTIs in the repetition window wherein the increased CCE limit is determined at least in part based on a capability of the UE.

~~28~~14. An apparatus for wireless communications by a user equipment ~~(~~, UE~~)~~, comprising:

means for monitoring for at least one physical downlink control channel ~~(~~, PDCCH~~),~~ from a network entity that schedules or triggers transmission of data, to or from the UE, as different copies of a same transport block ~~(~~, TB~~),~~ within a repetition window, wherein the network entity takes one or more actions designed to improve reliability of reception of the PDCCH by the UE; and

means for participating in the repetition based transmission scheduled or triggered by the at least one PDCCH~~.~~ wherein the one or more actions designed to improve reliability of reception of the PDCCH by the UE are taken only if the UE is configured for repetition-based transmission or reception of repetition-based transmission, wherein a single PDCCH schedules multiple copies of the TB, wherein the one or more actions taken by the network entity comprise:

29. An apparatusutilizing an increased control channel element, CCE, limit for wireless communications by a network entity, comprising:

a transmitter configured to transmit at least one physical downlink control channel (PDCCH) that schedules or triggersof a first transmission of data, to or from a user equipment (UE), as different copiestime interval, TTI, of a same transport block (TB) within a the repetition window; and

at least one processor configured to take utilizing a CCE limit less than the increased CCE limit for one or more actions, when transmittingother TTIs in the at least one PDCCH, designed to improve reliability of reception by the UE.

30. An apparatus for wireless communications by a user equipment (UE), comprising:

a receiver configured to monitor for at least one physical downlink control channel (PDCCH) from a network entity that schedules or triggers transmission of data, to or from the UE, as different copies of a same transport block (TB) within a repetition window, wherein the network entity takes one or more actions designed to improve reliability of receptionincreased CCE limit is determined at least in part based on a capability of the PDCCH by the UE; andUE.

at least one processor configured to participate in the repetition based transmission scheduled or triggered by the at least one PDCCH.