Claims

[Claim 1] A method performed by a user equipment (UE) in a wireless communication system, the method comprising:
receiving downlink control information (DCI) for scheduling physical downlink shared channel (PDSCH)s;
receiving the PDSCHs based on the DCI;
identifying values regarding a reception starting time of the PDSCHs, serving cell indices and physical downlink control channel (PDCCH) monitoring occasion (MO) indices, based on the DCI;
obtaining a hybrid automatic repeat request acknowledgement/negative acknowledgement (HARQ-ACK/NACK) codebook by multiplexing HARQ-ACK information for the PDSCHs, according to an order of downlink assignment indices (DAIs) identified based on the values regarding the reception starting time of the PDSCHs, the serving cell indices and the PDCCH MO indices; and
transmitting the HARQ-ACK/NACK codebook.

[Claim 2] The method of claim 1, wherein the order of DAIs for PDSCHs with a same service cell and a same MO are identified based on an increasing order of the values regarding the reception starting time of the PDSCHs.

[Claim 3] The method of claim 1, wherein the order of DAIs are firstly identified based on an increasing order of the values regarding the reception starting time, secondly identified based on an ascending order of serving cell indices, and thirdly identified based on an ascending order of the PDCCH MO indices.

[Claim 4] The method of claim 1, wherein the values regarding the reception starting time includes a time offset indicated in the DCI.

[Claim 5] A user equipment (UE), comprising:
a transceiver; and
a processor configured to:
receive, via the transceiver, downlink control information (DCI) for scheduling physical downlink shared channel (PDSCH)s,
receive, via the transceiver, the PDSCHs based on the DCI,
identify values regarding reception starting time of the PDSCHs, serving cell indices and physical downlink control channel (PDCCH) monitoring occasion (MO) indices, based on the DCI,
obtain a hybrid automatic repeat request acknowledgement/negative acknowledgement (HARQ-ACK/NACK) codebook by multiplexing HARQ-ACK information for the PDSCHs, according to an order of

downlink assignment indices (DAIs) identified based on the values regarding the reception starting time of the PDSCHs, the serving cell indices and the PDCCH MO indices, and

transmit, via the transceiver, the HARQ-ACK/NACK codebook.

[Claim 6] The UE of claim 5, wherein the order of DAIs for PDSCHs with a same service cell and a same MO are identified based on an increasing order of the values regarding the reception starting time of the PDSCHs.

[Claim 7] The UE of claim 5, wherein the order of DAIs are firstly identified based on an increasing order of the values regarding the reception starting time, secondly identified based on an ascending order of serving cell indices, and thirdly identified based on an ascending order of the PDCCH MO indices.

[Claim 8] The UE of claim 5, wherein the values regarding the reception starting time includes time offset indicated in the DCI.

[Claim 9] A method performed by a base station (BS) in a wireless communication system, the method comprising:

transmitting downlink control information (DCI) for scheduling physical downlink shared channel (PDSCH)s;

transmitting the PDSCHs based on the DCI, to a user equipment (UE); and

receiving, from the UE, a hybrid automatic repeat request acknowledgement/negative acknowledgement (HARQ-ACK/NACK) codebook including HARQ-ACK information for the PDSCHs, multiplexed according to an order of downlink assignment indices (DAIs) identified based on values regarding a reception starting time of the PDSCHs, serving cell indices and physical downlink control channel (PDCCH) monitoring occasion (MO) indices,

wherein the values regarding the reception starting time of the PDSCHs, the serving cell indices and the PDCCH MO indices are identified based on the DCI, at the UE.

[Claim 10] The method of claim 9, wherein the order of DAIs for PDSCHs with a same service cell and a same MO are identified based on an increasing order of the values regarding the reception starting time of the PDSCHs.

[Claim 11] The method of claim 9, wherein the order of DAIs are firstly identified based on an increasing order of the values regarding the reception starting time, secondly identified based on an ascending order of serving cell indices, and thirdly identified based on an ascending order of the PDCCH MO indices.

[Claim 12] The method of claim 9, wherein the values regarding the reception

starting time includes a time offset indicated in the DCI.

[Claim 13] A base station (BS) comprising:
a transceiver; and
a processor configured to:
transmit, via the transceiver, downlink control information (DCI) for scheduling physical downlink shared channel (PDSCH)s;
transmit, via the transceiver, the PDSCHs based on the DCI, to a user equipment (UE); and
receive, via the transceiver from the UE, a hybrid automatic repeat request acknowledgement/negative acknowledgement (HARQ-ACK/NACK) codebook including HARQ-ACK information for the PDSCHs, multiplexed according to an order of downlink assignment indices (DAIs) identified based on values regarding a reception starting time of the PDSCHs, serving cell indices and physical downlink control channel (PDCCH) monitoring occasion (MO) indices,
wherein the values regarding the reception starting time of the PDSCHs, the serving cell indices and the PDCCH MO indices are identified based on the DCI, at the UE.

[Claim 14] The BS of claim 13, wherein the order of DAIs for PDSCHs with a same service cell and a same MO are identified based on an increasing order of the values regarding the reception starting time of the PDSCHs.

[Claim 15] The BS of claim 13, wherein the order of DAIs are firstly identified based on an increasing order of the values regarding the reception starting time, secondly identified based on an ascending order of serving cell indices, and thirdly identified based on an ascending order of the PDCCH MO indices.

[Claim 16] The BS of claim 13, wherein the values regarding the reception starting time includes a time offset indicated in the DCI.