a base station of a cell, and transmit and/or receive communications on the carrier.

The communication system and associated devices typically operate in accordance with a given standard or specification which sets out what the various entities associated with the system are permitted to do and how that should be achieved. Communication protocols and/or parameters which shall be used for the connection are also typically defined. Examples of standardised radio access technologies include GSM (Global System for Mobile), EDGE (Enhanced Data for GSM Evolution) Radio Access Networks (GERAN), Universal Terrestrial Radio Access Networks (UTRAN) and evolved UTRAN (E-UTRAN). An example of standardized communication system architectures is the long-term evolution (LTE) of the Universal Mobile Telecommunications System (UMTS) radio-access technology. The LTE is being standardized by the 3rd Generation Partnership Project (3GPP). The LTE employs the Evolved Universal Terrestrial Radio Access Network (E-UTRAN) access. Further developments of LTE are sometimes referred to as LTE Advanced (LTE-A).

SUMMARY

According to a first aspect, there is provided a method comprising: using one or more of a set of redundancy versions, wherein positions of said redundancy versions in a buffer used in block coding satisfy one or more of the following criteria: a separation provided between a starting position of a third redundancy version RV2 and a starting position of a fourth redundancy version RV3 is larger than the separation between a starting position of a second redundancy version RV1 and a starting position of the third redundancy version RV2; a separation provided between the starting position of the second RV1, the starting position of third RV2, or the starting position of fourth redundancy version RV3 and the starting position of a respective previous consecutive redundancy version is increased; a starting position of the second redundancy version

RV1, third redundancy version RV2, and/or fourth redundancy version RV3 is outside

The method may be carried out in an apparatus of a base station.

According to another embodiment, there is provided a method comprising: using one or more of a set of redundancy versions, wherein positions of said redundancy versions in a buffer used in block coding satisfy the following criteria: a separation provided between a starting position of a third redundancy version RV2 and a starting position of a fourth redundancy version RV3 is larger than the separation between a starting position of a second redundancy version RV1 and a starting position of the third redundancy version RV2.

According to another embodiment, there is provided a method comprising: using one or more of a set of redundancy versions, wherein positions of said redundancy versions in a buffer used in block coding satisfy the following criteria: a separation provided between the starting position of the second RV1, the starting position of third RV2, or the starting position of fourth redundancy version RV3 and the starting position of a respective previous consecutive redundancy version is increased.

According to another embodiment, there is provided a method comprising: using one or more of a set of redundancy versions, wherein positions of said redundancy versions in a buffer used in block coding satisfy the following criteria: a starting position of the second redundancy version RV1, third redundancy version RV2, and/or fourth redundancy version RV3 is outside a region of system bits of said buffer.

According to an embodiment, there is provided a method comprising: using one or more of a set of redundancy versions, wherein positions of said redundancy versions in a buffer used in said block coding satisfy the following criteria: a separation between the starting position of the first redundancy version RV0 and the starting position of second redundancy version RV1 is larger than a separation between the starting position of the second redundancy version RV1 and the starting position of a third redundancy version RV2, and a separation between the starting

position of the third redundancy version RV2 and the starting position of a fourth redundancy version RV3.

According to an embodiment, there is provided a method using one or more of a set of redundancy versions, wherein positions of said redundancy versions in a buffer used in said block coding are such that a majority of said redundancy version positions are in one of a region of the buffer having system bits to be transmitted.

According to an embodiment, there is provided a method using one or more of a set of redundancy versions, wherein positions of said redundancy versions in a buffer used in said block coding are such that a majority of said redundancy version positions are in one of a region of the buffer having parity bits to be transmitted.

According to a second aspect, there is provided a method, comprising selecting at a base station a redundancy version based on an end position of a last transmission for an information block, said redundancy version being associated with block coding; and providing information on said selected redundancy version to a user device.

The information may comprise an index.

According to a third aspect, there is provided a method comprising: receiving information on a selected redundancy version at a user device, said redundancy version being associated with block coding; and using said information when communicating with a base station.

According to a fourth aspect, there is provided a computer program comprising program code means adapted to perform the steps of any one of the first, the second and the third aspects when the program is run on a data processing apparatus.

According to a fifth aspect, there is provided an apparatus, said apparatus comprising at least one processor, and at least one memory including computer program code, wherein the at least one memory and the computer program code are configured, with the at least one processor, to: use one or more of a set of redundancy versions, wherein positions of said redundancy versions in a buffer used in block coding satisfy one or more of the following criteria: a separation provided between a starting position of a third redundancy version RV2 and a

starting position of a fourth redundancy version RV3 is larger than the separation between a starting position of a second redundancy version RV1 and a starting position of the third redundancy version RV2; a separation provided between the starting position of the second RV1, the starting position of third RV2, or the starting position of fourth redundancy version RV3 and the starting position of a respective previous consecutive

The buffer may comprise a first region comprising system bits to be transmitted and a second region comprising parity bits to be transmitted.

The first, second, and third redundancy versions may be provided in said first region.

The fourth redundancy version may be provided in the second region.

The second, third and fourth redundancy versions may be provided in said second region.

The first redundancy version may be provided in the first region.

The fixed redundancy positions may be selected based on a starting position of at least a second transmission.

This may be by assuming sequential transmission.

According to another embodiment, there is provided an apparatus, said apparatus comprising at least one processor, and at least one memory including computer program code, wherein the at least one memory and the computer program code are configured, with the at least one processor, to: use one or more of a set of redundancy versions, wherein positions of said redundancy versions in a buffer used in block coding satisfy the following criteria: a separation provided between a starting position of a third redundancy version RV2 and a starting position of a fourth redundancy version RV3 is larger than the separation between a starting position of a second redundancy version RV1 and a starting position of the third redundancy version RV2.

According to another embodiment, there is provided an apparatus, said apparatus comprising at least one processor, and at least one memory including computer program code, wherein the at least one memory and the computer program code are configured, with the at least one processor, to: use one or more of a set of redundancy versions, wherein positions of said redundancy versions in a buffer used in block coding satisfy the following criteria: a separation provided between the starting position of the second RV1, the starting position of third RV2, or the starting position of fourth redundancy version RV3 and the starting

position of a respective previous consecutive redundancy version is increased.

According to another embodiment, there is provided an apparatus, said apparatus comprising at least one processor, and at least one memory including computer program code, wherein the at least one memory and the computer program code are configured, with the at least one processor, to: use one or more of a set of redundancy versions, wherein positions of said redundancy versions in a buffer used in block coding satisfy the following criteria: a starting position of the second redundancy version RV1, third redundancy version RV2, and/or fourth redundancy version RV3 is outside a region of system bits of said buffer.

According to another embodiment, there is provided an apparatus, said apparatus comprising at least one processor, and at least one memory including computer program code, wherein the at least one memory and the computer program code are configured, with the at least one processor, to: use one or more of a set of redundancy versions, wherein positions of said redundancy versions in a buffer used in said block coding satisfy the following criteria: a separation between the starting position of the first redundancy version RV0 and the starting position of second redundancy version RV1 is larger than a separation between the starting position of the second redundancy version RV1 and the starting position of a third redundancy version RV2, and a separation between the starting position of the third redundancy version RV2 and the starting position of a fourth redundancy version RV3.

According to another embodiment, there is provided an apparatus, said apparatus comprising at least one processor, and at least one memory including computer program code, wherein the at least one memory and the computer program code are configured, with the at least one processor, to: use one or more of a set of redundancy versions, wherein positions of said redundancy versions in a buffer used in said block coding are such that a majority of said redundancy version positions are in one of a region of the buffer having system bits to be transmitted.

According to another embodiment, there is provided an apparatus, said apparatus comprising at least one processor, and at least one memory

including computer program code, wherein the at least one memory and the computer program code are configured, with the at least one processor, to: use one or more of a set of redundancy versions, wherein positions of said redundancy versions in a buffer used in said block coding are such that a majority of said redundancy version positions are in one of a region of the buffer having parity bits to be transmitted.

According to another embodiment, there is provided an apparatus, said apparatus comprising at least one processor, and at least one memory including computer program code, wherein the at least one memory and the computer program code are configured, with the at least one processor, to: select at a base station a redundancy version based on an end position of a last transmission for an information block; and provide information on said selected redundancy version to a user device.

The information may comprise an index.

According to another embodiment, there is provided an apparatus, said apparatus comprising at least one processor, and at least one memory including computer program code, wherein the at least one memory and the computer program code are configured, with the at least one processor, to: receive information on a selected redundancy version at a user device, said redundancy version being associated with block coding; and using said information when communicating with a base station.

A device and/or a communication system comprising an apparatus configured to provide at least one of the embodiments can also be provided. The device may comprise a communication device such as a user equipment or another node capable of wireless communication, or a network node.

A computer program comprising program code means adapted to perform the herein described methods may also be provided. In accordance with further embodiments apparatus and/or computer program product that can be embodied on a computer readable medium for providing at least one of the above methods is provided.