station would have an improved control on the content and error resilience of the aperiodic CQI report.

SUMMARY OF THE INVENTION

Various embodiments seek~~One object of the present invention is~~ to suggest control signaling in a communication system that allows to trigger the independent transmission of a Channel Quality Indicator by a terminal without spoiling resources. Further, a corresponding base station and terminal are to be provided.

~~The object is solved by the subject matter of the independent claims.~~ Advantageous embodiments of the invention are subject matter of the dependent claims.

One main aspect of the invention is to use a selected transport format for CQI report in a predetermined reporting mode just in selected conditions. More generally, a control channel signal from a base station to a terminal is defined, which comprises a selected transport format, which is to be used by the terminal for user data transmission to the base station. The transport format is selected so that it has a minimum impact on the system. The interpretation of the selected transport format by the terminal depends on a CQI trigger signal comprised in the control channel signal.

One embodiment of the invention provides a method for providing control signalling in a communication system, comprising the steps performed by a base station of the communication system of generating a control channel signal comprising a transport format and a channel quality indicator trigger signal for triggering a transmission of a channel quality indicator by at least one terminal to the base station, and transmitting the generated control channel signal to at least one terminal, wherein said transport format is a predetermined format for user data transmission by the at least one terminal to the base station and said control channel signal indicates a predetermined mode for reporting the channel quality indicator to the base station, wherein the channel quality indicator transmission is to be triggered by the at least one terminal based on the channel quality indicator trigger signal.

Moreover, ~~the invention according to~~ other exemplary embodiments relate~~s~~ to the implementation of the methods described herein in software and hardware. Accordingly, another embodiment of the invention provides a non-transitory computer~~-~~-readable medium for storing instructions that, when executed on~~by~~ a processor of a base station, cause the base station to: ~~generate~~ transmit a control channel signal to a mobile terminal, wherein the control channel signal comprise~~sing~~ a Modulation and Coding Scheme (MCS) Index, information on resource blocks used for a transmission from the mobile terminal to the base station, ~~transport format~~ and a channel quality indicator trigger ~~signal~~ for triggering a transmission of an aperiodic channel quality indicator report from the mobile~~by at least one~~ terminal to the base station, and ~~transmit the generated control channel signal to at least one terminal, wherein said transport format is a predetermined format for user data transmission by the at least one terminal to the base station and said control channel signal indicates a predetermined mode for reporting the channel quality indicator to the base station, wherein the channel quality indicator transmission is to be triggered by the at least one terminal based on the channel quality indicator trigger signal~~receive from the mobile terminal the aperiodic channel quality indicator report when the channel quality indicator trigger is set, wherein the aperiodic channel quality indicator report is not multiplexed with data transmitted by the mobile terminal via an Uplink Shared Channel (UL-SCH) in case when the control channel signal indicates a determined value of the MCS Index and also indicates a number of resource blocks that is smaller than or equal to a determined number of resource blocks, and wherein the aperiodic channel quality indicator report is multiplexed with data transmitted by the mobile terminal via the UL-SCH, in case (a) when the control channel signal does not indicate the determined value of the MCS Index, or in case (b) when the control channel does not indicate a number of resource blocks that is smaller than or equal to the determined number of resource blocks.

A further embodiment relates to a non-transitory computer~~-~~-readable medium for storing instructions that, when executed on~~by~~ a processor of a terminal, cause the ~~mobile~~ terminal to: receive~~,~~ a control channel signal from a base station~~,~~ ~~a frame of physical radio resources comprising a control channel signal destined to the terminal,~~ wherein the control channel signal comprises a ~~predetermined transport format~~Modulation and Coding Scheme (MCS) Index, information on resource blocks used for a transmission from the mobile terminal to the base station, and a channel quality indicator trigger ~~signal~~ for triggering a transmission of an aperiodic channel quality indicator report ~~by the terminal~~ to the base station, ~~wherein said transport format is a predetermined format for~~

~~user data transmission by the at least one terminal to the base station and said control channel signal indicates a predetermined mode for reporting the channel quality indicator to the base station,~~ and transmit ~~a~~ the aperiodic channel quality indicator report to the base station ~~using the indicated predetermined mode, wherein the channel quality indicator transmission is triggered based on the channel quality indicator trigger signal~~. The transmitter is further configured: to transmit the aperiodic channel quality indicator report without multiplexing the aperiodic channel quality indicator report with data to be transmitted by the mobile terminal via an Uplink Shared Channel (UL-SCH), in case when the channel quality indicator trigger is set and the control channel signal indicates a determined value of the MCS Index and also indicates a number of resource blocks that is smaller than or equal to a determined number of resource blocks, and to transmit the aperiodic channel quality indicator report while multiplexing the aperiodic channel quality indicator report, with data to be transmitted by the mobile terminal via the UL-SCH, in case (a) when the channel quality indicator trigger is set and the control channel signal does not indicate the determined value of the MCS Index, or in case (b) when the channel quality indicator trigger is set and the control channel does not indicate a number of resource blocks that is smaller than or equal to the determined number of resource blocks.

BRIEF DESCRIPTION OF THE FIGURES

In the following, the invention is described in more detail in reference to the attached figures and drawings. Similar or corresponding details in the figures are marked with the same reference numerals.

Fig. 1 shows an exemplary data transmission to users in an OFDMA system in localized mode (LM) having a distributed mapping of L1/L2 control signaling,