[0012] To avoid contention-based access to the uplink common control channel, individual allocations are required to be signaled on the downlink common control channel. Alternatively, some mapping between the downlink allocation and uplink allocation may be defined. Each UE then accesses the uplink common control channel in accordance with its allocation. Since uplink transmissions cannot always be predicted by the network, and since uplink transmissions are infrequent, (in some applications transmitting only 5% of the time), periodic allocations of the uplink common control channel are also necessary for propagating uplink radio resource requests to support uplink user data. Additionally, when common control channels are used for AM&C operation, no inner loop power control mechanism exists for each UE, since the common control channels are not continuously available.

[0013] What is needed is an efficient method of performing power control while minimizing the overhead necessary to perform such a method. Power control will minimize the interference introduced by the uplink common control channel.

[0014] SUMMARY

[0015] The present invention determines the power level of an uplink common control channel transmission using an open loop technique, which signals information in the downlink prior to the uplink common control channel transmission in order to achieve an optimized power level. The base station allocates a specific uplink control channel indicating the uplink interference, and optionally, a quality margin for that timeslot. The UE transmits over the specific channel and determines an appropriate power level for transmission based on path loss calculated by the UE and the data received from the base station.

[0015a] According to a first aspect of the present invention, there is provided a method for determining uplink power level, implemented in a base station, comprising:

receiving a first communication signal over an uplink channel from a user equipment (UE);

measuring a channel quality of the uplink channel in response to the received first communication signal;

providing a quality margin derived from the first communication signal;

transmitting an allocation of an uplink channel and the quality margin over a downlink control channel to the UE; and

receiving a second communication from the UE in at least one time slot in the allocated uplink channel in response to the allocation of the uplink channel and the quality margin; wherein the second communication includes an adaptive modulation and coding report at a transmission power level derived from the quality margin.

[0015b] According to a second aspect of the present invention, there is provided a base station, comprising:

circuitry configured to receive a first communication signal over an uplink channel from a user equipment (UE);

circuitry configured to measure a channel quality of the uplink channel in response to the received first communication signal;

circuitry configured to provide a quality margin derived from the first communication signal; and

circuitry configured to transmit an allocation of an uplink channel and the quality margin over a downlink control channel to the UE; and

wherein the circuitry configured to receive the first communication is further configured to receive a second communication from the UE in at least one time slot in the allocated uplink channel in response to the allocation of the uplink channel and the quality margin; wherein the second communication includes an adaptive modulation and coding report at a transmission power level derived from the quality margin.

[0015c] According to a third aspect of the present invention, there is provided a user equipment (UE) comprising:

circuitry configured to transmit a first communication over an uplink channel; and

circuitry configured to receive control information on a downlink control channel from a base station in response to the first communication; wherein the control information indicates an allocation of an uplink channel and a quality margin determined from the first communication;

wherein the circuitry is further configured in response to receiving the control information to transmit a communication in the allocated uplink channel in a time interval including at least one time slot; wherein the communication includes an adaptive modulation and coding report; wherein a transmission power level of the communication is derived from the control information including the quality margin and a pathloss measured by the UE.

[0015d] According to a fourth aspect of the present invention, there is provided a method for determining uplink power level, implemented in a user equipment (UE), comprising:

transmitting a first communication over an uplink channel;

receiving control information on a downlink control channel from a base station in response to the first communication; wherein the control information indicates an allocation of an uplink channel and a quality margin determined from the first communication; and

transmitting a communication in the allocated uplink channel in a time interval including at least one time slot, in response to receiving the control information; wherein the communication includes an adaptive modulation and coding report; wherein a transmission power level of the communication is derived from the control information including the quality margin and a pathloss measured by the UE.

[0016] BRIEF DESCRIPTION OF THE DRAWING(S)

[0017] Fig. 1A is a simplified block diagram of a base station of the present invention.