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TSG-RAN Working Group1 meeting # 7   **TSGR1#7(99)A96**

Source: **InterDigital Communications Corporation**

Title: **Text Proposal for 25.224**

Document for: **Decision**

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Introduction

The following text proposal modifies Section 4.3.3 which defines the power control of uplink physical channels. The changes are made with respect to the text in R1-99a68 which was accepted as a working assumption in WG1 #6. The changes are summarized below:

- The text in 4.3.3.1 on power control of uplink common channels was modified to reflect the fact that reference transmit power is broadcasted on BCH, and not the actual value of the transmit power.
- The closed loop power control option for uplink dedicated channels was eliminated.
- The description of the parameter α was slightly modified to reflect the fact that the reference for pathloss measurement is not the most recent downlink time slot but the most recent downlink CCPCH timeslot.

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4.3.3 Uplink Control

4.3.3.1 Common Physical Channel

The transmitter power of UE shall be calculated by the following equation:

$$P_{PRACH} = L_{CCPCH} + I_{BTS} + \text{Constant value}$$

where, P_{PRACH} : transmitter power level in dBm,
L_{CCPCH}: measure~~d~~ representing path loss in dB (reference transmit power is broadcasted on BCH),
I_{BTS}: interference signal power level at cell's receiver in dBm, which is broadcasted on BCH
Constant value: This value shall be set via Layer 3 message (operator matter).

4.3.3.2 Dedicated Physical Channel

The initial transmission power is decided in a similar manner as PRACH. After the synchronisation between nodeB and UE is established, the UE transits into open-loop ~~or closed loop~~ transmitter power control (TPC).

UL Open Loop Power Control:

The transmitter power of UE shall be calculated by the following equation:

$$P_{UE} = \alpha L_{CCPCH} + (1-\alpha)L_0 + I_{BTS} + SIR_{TARGET} + \text{Constant value}$$

Where, P_{UE} : transmitter power level in dBm,

L_{CCPCH}: measure representing path loss in dB (reference transmit power is broadcast on BCH).

L_0: Long term average of path loss in dB

I_{BTS}: interference signal power level at cell's receiver in dBm, which is broadcasted on BCH

α: α is a weighting parameter which represents the quality of path loss measurements. α may be a function of the time delay between the uplink time slot and the most recent down link CCPCH time slot. α is calculated at the UE. An example for calculating α as a function of the time delay is given in Annex 1.

SIR_{TARGET}: Target SNR in dB. A higher layer outer loop adjusts the target SIR.

Constant value: This value shall be set via Layer 3 message (operator matter).

UL Closed Loop Power Control:

Closed-loop TPC is based on SIR, and the TPC processing procedures are the same as the FDD mode. During this power control process, the nodeB periodically makes a comparison between the received SIR measurement value and the target SIR value. When the measured value is higher than the target SIR value, TPC bit = „0,,. When this is lower than the target SIR value, TPC bit = „1,,. At the UE, soft decision on the TPC bits is performed, and when it is judged as „0,,, the mobile transmit power shall be reduced by one power control step, whereas if it is judged as „1,,, the mobile transmit power shall be raised by one TPC step. A higher layer outer loop adjusts the target SIR. This scheme allows quality based power control.

When the TPC bit cannot be received due to out-of-synchronisation, the transmission power value shall be kept at a constant value. When SIR measurement cannot be performed for being out-of-synchronisation, the TPC bit shall always be = „1,, during the period of being out-of-synchronisation.